SUBJECT INDEX.

[References to the papers read before the Institute are indicated by the word *Paper* following the page number. The letter *P.* denotes a reference to a subject incidentally mentioned in a paper. The letters *D.* and *A.* denote references to discussions on papers and to the section dealing with abstracts respectively.]

ABNORMAL STEEL, transformations, 508*A*.
ABRASIVE WHEELS, use, 405*A*.
ACID OPEN-HEARTH PROCESS, reactions, 377*A*.
ACIÉRIES DE MICHEVILLE, billet mills, 398*A*.
AGE-HARDENING :
  metals, 467*A*, 498*A*.
  theory, 468*A*.
AGEING :
  cold-drawn wire, 477*A*.
  iron-copper alloys, lattice changes, 468*A*.
  steel, 380*A*.
  steel, effect of deoxidation, 468*A*.
  steel, effect of nitrogen and oxygen, 469*A*.
  steel wire, 516*A*.
AGEING EMBRITTLEMENT, chromium steel, 469*A*.
AIRCRAFT CONSTRUCTION :
  use of ferrous metals, 488*A*.
  use of nickel-chromium steel, 493*A*.
  use of stainless steel, 493*A*, 514*A*, 515*A*.
AIRCRAFT MATERIALS, welding, 422*A*.
AJAX-HOGUE WIRE-DRAWING MACHINE, 406*A*.
AKRILL, C. & CO., LTD., foundry plant, 369*A*.
ALASKA :
  coal deposits, 317*A*.
  mineral industry, 316*A*.
ALLOY SYSTEMS, constitution, 498*A*.
ALLOYS :
  aluminium, properties, 485*A*.
  beryllium, use for clock springs, 493*A*.
  cadmium - zinc, electrodeposition, 440*A*.
  chromium-aluminium-iron, properties, 515*A*.
  copper, properties, 485*A*.
  copper, welding, 422*A*.
  corrosion-resistant, properties, 517*A*.
  four-component, equilibrium diagram, 509*A*.
ALLOYS (*contd.*)—
  heat-resistant, properties, 490*A*.
  iron, wear, 472*A*.
  iron-aluminium, transformations, 225, *Paper*.
  iron-carbon, specific heat, 513*A*.
  iron-chromium, effect of nitrogen, 511*A*.
  iron-chromium, properties, 511*A*.
  iron-chromium, thermal expansion, 511*A*.
  iron - chromium, transformations, 511*A*.
  iron-copper, ageing, lattice changes, 468*A*.
  iron-nickel, magnetic properties, 467*A*.
  iron-zinc, high crystallisation force, 513*A*.
  low expansibility, 474*A*.
  nickel, use for magnets, 496*A*.
  nickel-iron, electrodeposition, 439*A*.
  nickel-iron, magnetic properties, 498*A*.
  properties, 35 (*Presidential Address*).
  structure, 498*A*.
  transformations, 498*A*.
ALTERNATING BEND STRENGTH, steel wire, 483*A*.
ALTERNATING STRESS, notch-sensitiveness of steel, 480*A*.
ALTERNATING STRESSING, tubes under internal pressure, 484*A*.
ALUMINA, determination in steel, 528*A*.
ALUMINA SILICA RATIO, refractory materials, effect of oxidation, 323*A*.
ALUMINIUM :
  determination in steel, 528*A*.
  effect in cast iron, expansion coefficient, 449*A*.
  effect in steel, case-hardening, 412*A*.
  effect in steel, nitriding, 413*A*.
  separation, benzoate method, 532*A*.
ALUMINIUM ALLOYS, properties, 485*A*.
ALUMINIUM-NICKEL STEEL, use for magnets, 497*A*, 498*A*.
ALUMINIUM ORE DEPOSITS, Yugoslavia, 316*A*.

AMBERG, iron ore deposits, 316*A*.
AMERICAN COAL, coking properties, 341*A*, 342*A*.
AMERICAN SPIRAL SPRING AND MANUFACTURING CO., heat-treatment plant, 411*A*.
AMERICAN STEEL AND WIRE CO., soaking pits, 388*A*.
AMMONIA, manufacture from blast-furnace gas, 357*A*.
ANALYSIS :
  fuel, 532*A*.
  gas, confining liquids, 533*A*.
  gas, slow-combustion pipette, 533*A*.
  iron and steel, 528*A*.
  ores and fluxes, 532*A*.
  spectrum, 531*A*.
ANCIENT IRON, Scotland, 359*A*.
ANNEALING :
  bright, Grünewald system, 415*A*.
  bright, razor blades, 417*A*.
  bright, steel, 415*A*, 416*A*.
  effect on tungsten magnet steel, 497*A*.
  sheets, 416*A*.
ANNEALING FURNACES :
  controlled atmospheres, 411*A*.
  electric, 410*A*.
  for strip and wire, 410*A*.
ANNUAL DINNER, report, 305.
ANTHRACITE, use in blast-furnace, 336*A*.
ANTIMONY, effect in nickel cast iron, 454*A*.
APPLEBY-FRODINGHAM STEEL CO., sintering plant, 320*A*.
ASSOCIATES, election, 1.
AUSTENITE :
  decomposition in alloy steel, 507*A*.
  decomposition rate, dependence on temperature, 507*A*.
  structure, 507*A*.
AUSTENITIC STEEL, notch-sensitiveness under alternating stress, 480*A*.
AUTOMOBILE SHEETS, deep-drawing, 394*A*.
AUTOMOBILE STEEL, machining, 473*A*.

BALL-BEARING RACES, heat-treatment, 418*A*.
BALLS, steel, manufacture, 435*A*.
BARNSLEY COAL, coking properties, 341*A*.
BARS :
  heating, time required, 389*A*.
  notched, bend tests, 459*A*.
  specification, British, 494*A*.
BASIC BESSEMER PRACTICE, effect of blowing time on output, 374*A*.
BASIC OPEN-HEARTH FURNACE, manufacture of deep-drawing steel, 376*A*.
BASIC OPEN-HEARTH PROCESS :
  iron oxide control, 380*A*.
  reactions, 377*A*.
BASIC SLAGS :
  microscopic examination, 383*A*.
  oxidising power, 91, *Paper*.
BATHS, moulding, 367*A*.
BAUXITE DEPOSITS, Germany, 316*A*.
BAVARIA, iron ore deposits, 316*A*.
BEAMS, broad-flange, rolling, 399*A*.
BEARINGS :
  anti-friction, lubrication, 397*A*.
  artificial resin, 396*A*, 397*A*.
  cast iron for, 452*A*.
  load-carrying capacity, 396*A*.
  roller, design and construction, 396*A*.
  roller, frictional resistance, 396*A*.
  tempering, 420*A*.
BECKER COKE OVEN, 340*A*.
BEND STRENGTH, alternating, steel wire, 483*A*.
BEND TENSILE TESTS, 459*A*.
BEND TESTS :
  cast iron, 447*A*.
  as a guide to ductility, 458*A*.
  notched bars, 459*A*.
BENZENE PRESSURE EXTRACTION, coal, 334*A*.
BENZOL :
  determination in gas, 534*A*.
  increased yield in coking, 344*A*.
BERYLLIUM, effect in steel, 493*A*.
BERYLLIUM ALLOYS, use for clock springs, 493*A*.
BESSEMER CONVERTERS, wear of lining and change of shape, 373*A*.
BESSEMER MEDAL, award to A. M. Portevin, 29.
BESSEMER PRACTICE, basic, effect of blowing time on output, 374*A*.
BETHLEHEM STEEL CO. :
  electrogalvanising plant, 441*A*.
  method of rolling beams, 399*A*.
  wear-resistant steel, 472*A*.
BIBLIOGRAPHY, 547.
  cupping tests, 394*A*.
  properties of metals, 498*A*.
BILLET MILLS, 398*A*.
BILLETS, chipping machines, 406*A*.
BITUMINOUS COATINGS, for pipes, 445*A*.
BLACKPLATE, rolling, 402*A*.
BLAST-FURNACE :
  anthracite coal, 336*A*.
  behaviour of cyanides, 357*A*.
  behaviour of phosphorus, 335*A*.
  burdening of ore, 354*A*.

BLAST FURNACE (*contd.*)—
carbon-deposition, 325*A*.
control, 353*A*.
design, Russia, 351*A*.
design, United States, 351*A*.
flue-dust, recovery of iodine, 357*A*.
flue-dust injection, Heskamp process, 355*A*.
heat loss, effect of bosh tuyeres, 59*P*.
heat loss, effect of cooling winds, 59*P*.
heat loss, effect of exposed sites, 59*P*.
heat loss, effect of life of lining, 59*P*.
heat loss, effect of rate of drive, 59*P*.
heat loss, effect of water cooling, 59*P*.
heat losses, 59, *Paper*
potash recovery, 357*A*.
production of phosphoric acid, 357*A*.
reactions of silicon with sulphur, 357*A*.
reduction of manganese oxide, 356*A*.
scrap additions, 355*A*.
shaft temperatures, 65*P*.
slack wind, 355*A*.
tap-hole gun, 351*A*.
use of oxygen, 354*A*.
BLAST-FURNACE GAS :
cleaning, 349*A*.
cleaning, Lodge-Cottrell plant, 349*A*.
use for ammonia manufacture, 357*A*.
BLAST-FURNACE PLANT, Youngstown Sheet and Tube Co., 351*A*.
BLAST-FURNACE PRACTICE, 354*A*.
British, 353*A*.
BLAST-FURNACE SLAG :
effect of sulphides, 357*A*.
use as fertiliser, 358*A*.
BLAST-FURNACE STOVES :
checkerwork, 351*A*, 352*A*.
checkerwork, Duoflex type, 352*A*.
draft in chimneys, 353*A*.
BLOOMING MILLS, electric driving, 403*A*.
BLOWERS, turbo, use for producers, 347*A*.
BOCHUMER VEREIN, history, 359*A*.
BOILER DRUMS :
welded, 423*A*.
weldless, manufacture, 392*A*.
BOILER PLATE :
overheating, 487*A*.
overstressing, 466*A*.
stresses, 466*A*.
BOILER PRACTICE, 330*A*.
BOILER TUBES, endurance tests, 482*A*.
BOILERS :
failure, 330*A*.
heat transmission, 330*A*.
BOLT THREADS, strengthening effect, 486*A*.
BOLTS, impact and tensile properties, 459*A*.
BONNEY-FLOYD CO., heat-treatment practice, 417*A*.
BONNOT-LENTZ CHIPPING MACHINE, 406*A*.
BOOK NOTICES, 535.
BRACKELSBERG FURNACE, 381*A*.
BRASS, bright annealing, 416*A*.
BRAZIL, zirconium ore deposits, 319*A*.
BRAZING, castings, 432*A*.
BRIDGE, cast iron, examination of specimens from, 517*A*.
BRIGGS BODIES, LTD., sheet metal department, 394*A*.
BRINELL HARDNESS, relation to scratch hardness, 470*A*.
BRIQUETTE PITCH, tests, 339*A*.
BRITISH COALS, analyses and types, 334*A*.
BRITTLENESS :
steel, 470*A*, 471*A*.
temper, steel, 420*A*.
BRONZE WELDING PROCESS, 422*A*.
BROSIUS CLAY GUN, 352*A*.
BULLARD-DUNN PROCESS, 436*A*.
BURNING :
magnesite bricks, 322*A*.
steel in reheating furnaces, 389*A*.
BUTANE, utilisation, 350*A*.
BY-PRODUCTS, yield from coal, 341*A*

CABLES, dynamic stressing, 489*A*.
CADMIUM, electrodeposition, 438*A*, 518*A*.
CADMIUM-ZINC ALLOYS, electrodeposition, 440*A*.
CADMIUM-ZINC COATINGS, for steel, 518*A*.
CALCIUM FERRITES, dissociation pressure, 97*P*.
CANNEL COAL, relation to durain, 335*A*.
CAR WHEELS, forging, 392*A*.
CARBIDE :
iron, specific heat, 513*A*.
iron, thermal decomposition, 506*A*.
CARBIDE CUTTING TOOLS, manufacture, 435*A*.
CARBIDES :
in hardened and tempered steel, 504*A*.
vanadium steel, 512*A*.
CARBON :
control in cupolas, 360*A*.
deposition in blast-furnaces, 325*A*.
effect in iron, notch toughness, 461*A*.
effect in steel, 509*A*.

CARBON (*contd.*)—
effect in steel, creep strength, 474*A*.
effect in steel, fatigue and damping capacity, 481*A*.
effect in steel, hardness, 472*A*.
effect in steel, wear, 472*A*.
CARBON-MANGANESE-SILICON STEEL, wear-resistant, 472*A*.
CARBON-OXYGEN EQUILIBRIUM in molten steel, 381*A*.
CARBON STEEL :
fatigue under repeated impact, 484*A*.
surface decarburisation, 129*P*.
CARBONISATION, low-temperature, coal, 346*A*.
CARBONISATION PROCESSES :
"Coal-in-oil," 346*A*.
"L. and N.," 346*A*.
CARBURISATION, copper steel, 412*A*.
CARBURISED STEEL, hardness, 469*A*.
CARBURISING PRACTICE, 412*A*.
CARGO FLEET IRON CO., coking plant, 340*A*.
CARNEGIE METHOD of forging car wheels, 392*A*.
CARNEGIE RESEARCH GRANTS, award, 33.
CASE-HARDENING PRACTICE, 412*A*.
CASE-HARDENING STEEL, effect of elements, 412*A*.
CAST IRON :
alloy, properties, 454*A*, 485*A*.
alloy, use for pressing dies, 392*A*.
bend tests, 447*A*.
centrifugal casting, 368*A*.
chilled, properties, 366*A*.
chilling properties, 366*A*.
chromium, 518*A*.
chromium-nickel, 518*A*.
Civil War period, properties, 493*A*.
corrosion, 517*A*.
corrosion-resistant, 453*A*.
decarburisation by hydrogen, 449*A*.
effect of copper, 455*A*.
effect of elements, 454*A*.
effect of molybdenum, 455*A*.
effect of titanium, 493*A*.
elastic hysteresis, 447*A*.
enamelling, 444*A*.
endurance properties, influence of various factors, 479*A*.
endurance tests, 482*A*.
expansion coefficient, 449*A*.
graphite formation, 451*A*.
graphite solution rate, 451*A*.
growth, effect of phosphorus, 452*A*.
growth, effect of special mixtures, 452*A*.
hardening, 414*A*.
CAST-IRON (*contd.*)
hardening, surface, 414*A*.
heat treatment, 421*A*.
high-duty, manufacture, 361*A*.
impact-bend tests, effect of testing temperature, 448*A*.
manufacture in electric furnace, 361*A*.
melting in rotary furnaces, 361*A*.
nickel, effect of antimony, 454*A*.
nickel-copper-chromium, corrosion resistance, 454*A*.
nickel, corrosion-resistance, 454*A*.
nitriding, 413*A*.
permanent set, 447*A*.
properties, effect of casting conditions, 451*A*.
properties, effect of treatment with different slags, 450*A*.
properties and tests, 447*A*.
strength, evaluation by Mohr's theory, 448*A*.
structure, development, 451*A*.
structure, effect of slag control, 449*A*.
suitability for coating, 452*A*.
superheating, 451*A*.
superheating in Schury furnace, 361*A*.
tensile tests, 447*A*.
treatment with sodium carbonate, 361*A*.
use for bearings, 452*A*.
use in chemical engineering, 453*A*.
welding, 424*A*.
CAST IRON GIRDERS, tests, 447*A*.
CAST STEEL, properties, 485*A*.
CASTING, centrifugal, 368*A*.
CASTING CONDITIONS, effect on cast iron, 451*A*.
CASTINGS :
brazing, 432*A*.
chilled, manufacture, 366*A*.
cleaning, 362*A*.
contraction allowance, 368*A*.
cooling phenomena and defects, 370*A*.
iron, soundness, 370*A*.
shrinkage, 371*A*.
silicon-iron, 518*A*.
steel, contraction, 371*A*.
steel, cracking during pickling, 438*A*.
steel, defects, 369*A*, 371*A*.
steel, feeding methods, 366*A*, 368*A*.
steel, heat-treatment, 417*A*.
steel, moulding, use of green sand, 369*A*.
steel, porosity, 371*A*, 372*A*.
steel, solidification, 371*A*.
steel, specification, British, 495*A*.

CASTINGS (*contd.*)—
thickness determination, 521*A*.
X-ray examination, 501*A*.
CATALYSTS, use in cementation process, 412*A*.
CEMENT, slag, effect of sulphides, 357*A*.
CEMENTATION, metallic, metals, 518*A*.
CEMENTATION PROCESS, use of catalysts, 412*A*.
CEMENTITE :
etching reagents, 499*A*.
specific heat, 513*A*.
thermal decomposition, 506*A*.
CHAIN LINKS, forging, 392*A*.
CHAINS, specification, German, 495*A*.
CHANCE COAL-CLEANING PROCESS, 337*A*.
CHECKERWORK :
blast-furnace stoves, 351*A*, 352*A*.
blast-furnace stoves, Duoflex type, 352*A*.
Moll, 375*A*.
CHEMICAL ENGINEERING, use of cast iron, 453*A*.
CHEVROLET CO., foundry plant, 360*A*, 363*A*, 370*A*.
CHILLED CAST IRON, properties, 366*A*.
CHILLED CASTINGS, manufacture, 366*A*.
CHILLED ROLLS, alloy, manufacture, 366*A*.
CHILLED WHEELS, manufacture, 366*A*.
CHILLING PROPERTIES, cast iron, 366*A*.
CHINA, coal deposits, 318*A*.
CHIPPING MACHINES, Bonnot-Lentz, 406*A*.
CHLORIDES, determination in nickel plating baths, 531*A*.
CHROMADOR STEEL, fatigue, 483*A*.
CHROME BRICK, *see* Refractory Brick.
CHROME-MAGNESITE BRICKS, *see* Refractory Bricks.
CHROME ORE DEPOSITS :
318*A*.
Yugoslavia, 316*A*.
CHROMEL-ALUMEL, use for thermocouples, 409*A*, 410*A*.
CHROMIUM :
determination in chromium-plating baths, 531*A*.
effect in cast iron, expansion coefficient, 449*A*.
effect in steel, case-hardening, 412*A*.
effect in steel, creep strength, 474*A*.
effect in steel, nitriding, 413*A*.
electrodeposition, 438*A*, 439*A*, 518*A*.
separation, benzoate method, 532*A*.
CHROMIUM-ALUMINIUM-IRON ALLOYS, properties, 515*A*.
CHROMIUM CAST IRON, 518*A*.
CHROMIUM COATINGS, corrosion, 526*A*.
CHROMIUM-COPPER STEEL, fatigue, 483*A*.
CHROMIUM-MOLYBDENUM STEEL, creep, 476*A*.
CHROMIUM - MOLYBDENUM - VANADIUM STEEL, nitriding, 413*A*.
CHROMIUM-NICKEL CAST IRON, 518*A*.
CHROMIUM - NICKEL - MOLYBDENUM STEEL, effect of composition, heat-treatment and degree of forging, 486*A*.
CHROMIUM-NICKEL STEEL :
corrosion-resistance, 520*A*.
flakes, 385*A*.
intercrystalline corrosion, 521*A*, 522*A*.
pitting, 515*A*.
temper-brittleness, 420*A*.
uses, 518*A*.
welding, 424*A*, 425*A*.
CHROMIUM-NICKEL-TUNGSTEN STEEL :
homogenisation, 386*A*.
torsional fatigue, effect of size and shape of test-piece, 481*A*.
CHROMIUM-NITROGEN SYSTEM, 512*A*.
CHROMIUM-PLATING BATHS, determination of chromium, 531*A*.
CHROMIUM STEEL :
ageing embrittlement, 469*A*.
corrosion in soya bean souse, 515*A*.
corrosion-resistance, 520*A*.
notch-sensitiveness under alternating stress, 480*A*.
properties, 490*A*.
temper-brittleness, 420*A*.
transformation, hardening and tempering phenomena, 509*A*.
use in oil refineries, 516*A*.
welding, 424*A*, 425*A*.
CHROMIUM-VANADIUM STEEL :
surface decarburisation, 129*P*.
surface decarburisation, effect on impact resistance, 166*P*.
CHROMIUM-VANADIUM STEEL WIRE, 407*A*.
CHURCHILL GRINDING MACHINE, 405*A*.
CITRIC ACID :
corrosion of steel, 522*A*.
corrosion of steel, hydrogen diffusion, 527*A*.
CLEANING :
blast-furnace gas, 349*A*.
blast-furnace gas, Lodge-Cottrell plant, 349*A*.
castings, 362*A*.
coal, 336*A*.
coal, Chance process, 337*A*.

CLEANING (*contd.*)—
coal, clarification of washery water, 338*A*.
coal, De Vooys' process, 337*A*.
coal, Lessing process, 337*A*.
coal, "Static" dry washer, 337*A*.
gas, 348*A*.
gas, Gyrepur apparatus, 348*A*.
gas, Whessoe dedusting plant, 348*A*.
gas, W.W.D. electro-detarrer, 348*A*.
metals, 434*A*, 435*A*, 436*A*.
metals, electrochemical, 301. *Paper*.
metals by trichlorethylene, 518*A*.
steel, Dreibrite process, 435*A*.
CLEANING MACHINES, electric driving, 435*A*.
CLEVELAND WIRE SPRING CO., heat-treatment plant, 411*A*.
COAL :
action of solvents, 334*A*.
American, coking properties, 341*A*, 342*A*.
analysis, 532*A*.
ash fusion temperature, 328*A*.
Barnsley, coking properties, 341*A*.
benzene pressure extraction, 334*A*.
British, analyses and types, 334*A*.
by-product yields, 341*A*.
cannel, relation to durain, 335*A*.
carbonisation, low-temperature, 346*A*.
cleaning, 336*A*.
cleaning, Chance process, 337*A*.
cleaning, clarification of washery water, 338*A*.
cleaning, De Vooys' process, 337*A*.
cleaning, Lessing process, 337*A*.
cleaning, "Static" dry washer, 337*A*.
coking, effect of heating rate, 343*A*.
coking properties, 341*A*, 342*A*.
composition, effect on fusion characteristics, 335*A*.
dedusting, 337*A*.
drying, 343*A*.
flotation, 336*A*.
grindability, 338*A*.
hydrogenation, 350*A*.
liquid, Wyndham process, 350*A*.
phosphorus contents, 335*A*.
pulverised, combustion, 338*A*.
pulverised, utilisation, 339*A*.
Ruhr, decomposition, 335*A*.
sampling, 532*A*.
stored, coking properties, 342*A*.
Upper Silesian, coking properties, 342*A*.
COAL-CLEANING PLANT :
Cymmer Colliery, 337*A*.
Wearmouth Colliery, 337*A*.
COAL DEPOSITS :
Alaska, 317*A*.
China, 318*A*.
Germany, 316*A*.
United States, 317*A*.
Wales, 316*A*.
Yugoslavia, 316*A*.
COAL DUST :
microscopic examination, 339*A*.
use in moulds, 365*A*.
"COAL-IN-OIL" CARBONISATION PROCESS, 346*A*.
COAL TAR, properties, 347*A*.
COAL WASHERIES, sampling procedure, 533*A*.
COATING :
cadmium-zinc, for steel, 518*A*.
chromium, corrosion, 526*A*.
galvanised, types of spangles, 441*A*.
metallic, microstructure, 440*A*.
metallic, weight determination, Glazunov method, 442*A*.
metals, 438*A*.
nickel, corrosion, 526*A*.
nickel, structure and properties, 439*A*.
protective, 517*A*.
tin, corrosion-fatigue, 526*A*.
tin, porosity determination, 442*A*.
tin, weight determination, 442*A*.
zinc, corrosion-fatigue, 526*A*.
COATINGS, bituminous for pipes, 445*A*.
COBALT :
effect in steel, case-hardening, 412*A*.
magnetostriction, 496*A*.
COBALT-CHROMIUM STEEL, effect of heat-treatment, 510*A*.
COBALT MAGNET STEEL, properties, 498*A*.
COBALT-MANGANESE STEEL, effect of heat-treatment, 510*A*.
COBALT STEEL, burning, 389*A*.
COBALT-TITANIUM-NICKEL STEEL, use for magnets, 497*A*.
COEFFICIENT OF EXPANSION, cast iron, 449*A*.
COKE :
combustion, 329*A*.
foundry, properties, 347*A*.
phosphorus content, 335*A*.
reactivity, 347*A*.
use in producers, 347*A*.
COKE-OVEN WALLS, stresses, 325*A*.
COKE OVENS :
Becker, 340*A*.
Gibbons-Kogag, 340*A*.

COKE OVENS (*contd.*)—
mechanical equipment, 340*A*.
refractory materials, 324*A*, 325*A*.
roof flues, 343*A*, 344*A*.
roof flues, Goldschmidt system, 344*A*.
Still, 343*A*.
COKING, coal, effect of heating rate, 343*A*.
COKING INDUSTRY, 340*A*.
COKING PLANT :
Cargo Fleet Iron Co., 340*A*.
South African Iron and Steel Corp., 340*A*.
Yorkshire Coking and Chemical Co., 340*A*.
Youngstown Sheet and Tube Co., 351*A*.
COKING PRACTICE :
increased benzol yield, 344*A*.
removal of volatiles, 343*A*.
COKING PROCESS :
effect of additions, 342*A*.
flow of heat, 345*A*.
Knowles, 346*A*.
COKING PROPERTIES :
American coal, 341*A*, 342*A*.
coal, 341*A*, 342*A*.
durain, 345*A*.
stored coal, 342*A*.
Upper Silesian coal, 342*A*.
COKING WASTE LIQUORS, clarification, 345*A*.
COLBROOKDALE BRIDGE, examination of specimens from, 517*A*.
COLD DRAWING, rods, effect of die shape, 394*A*.
COLD-HEADING MACHINE, combined with wire-drawing, 406*A*.
COLD PRESSING :
metals, 393*A*.
requirements of materials, 394*A*.
COLD-ROLLING :
metals, 400*A*.
razor blades, 417*A*.
COLD-WORKING, corrosion-resistant steel, 517*A*.
COLORADO, coal deposits, 317*A*.
COLVILLES, LTD., rolling-mill plant, 398*A*.
COMBUSTION :
coke, 329*A*.
flame studies, 329*A*.
pulverised coal, 338*A*.
theoretical temperature, 329*A*.
COMPRESSION TESTS, structural steel at high temperature, 476*A*.
CONCENTRATION, magnetic, iron ore, 320*A*.
CONDUCTIVITY :
electrical, metals, 474*A*.
thermal, insulating brick, 324*A*.
thermal, metals, 474*A*.
thermal, refractory materials, 324*A*.
CONTRACTION, steel castings, 371*A*.
CONTROL :
blast-furnaces, 353*A*.
temperature in reheating furnaces, 390*A*.
CONTROL APPARATUS, 333*A*.
CONTROL INSTRUMENTS, rolling mills, 403*A*.
CONVERTERS, wear of lining and change of shape, 373*A*.
CONVEYING MACHINES, strip mills, 406*A*.
CONVEYORS :
for foundries, 370*A*.
for wire mills, 407*A*.
COPPER :
bright annealing, 416*A*.
determination in copper-molybdenum steel, 529*A*.
effect in cast iron, 455*A*.
effect in cast iron, expansion co-efficient, 449*A*.
effect in malleable cast iron, 455*A*.
effect in steel, case-hardening, 412*A*.
effect in steel, corrosion-resistance, 492*A*.
effect in steel, creep strength, 475*A*.
effect in steel, scaling and red-shortness, 492*A*.
shear tests, effect of fluid pressure, 462*A*.
solubility in iron, 468*A*.
COPPER ALLOYS :
properties, 485*A*.
welding, 422*A*.
COPPER-MOLYBDENUM STEEL, determination of copper, 529*A*.
COPPER-NICKEL-MOLYBDENUM STEEL, properties, 493*A*.
COPPER-ORE DEPOSITS, Yugoslavia, 316*A*.
COPPER STEEL :
carburisation, 412*A*.
cast, properties, 492*A*.
Esco, 518*A*.
properties, 517*A*.
CORBY, Knowles coking process, 345*A*.
CORES :
green-sand, properties, 364*A*.
loam, properties, 364*A*.
manufacture, 363*A*.
tolerances for, 363*A*.

CORROSION :
cast iron, 517*A*.
chromium steel in soya bean souse, 515*A*.
depth of immersion of specimen, effect on corrosion rate, 270*D*.
effect of motor-electrolytic current, 524*A*.
hot-water systems, 524*A*.
intercrystalline, 482*A*.
intercrystalline, chromium - nickel steel, 521*A*, 522*A*.
intercrystalline, steel, 521*A*.
measurement, 520*A*.
metals, 516*A*.
metals at high temperatures, 517*A*.
metals in zinc-chloride-treated wood, 526*A*.
nickel and chromium coatings, 526*A*.
oil tankers, 524*A*.
oxygen supply to specimens, 275*D*.
pipes and tubes, 519*A*, 525*A*.
prevention by use of secondary electrolytic actions, 518*A*.
probability, 273*D*.
probability, effect of various factors, 516*A*.
sheet piling, 523*A*.
ship plates, 516*A*.
ships, 272*D*, 281*D*, 524*A*.
sleepers in mines, 517*A*.
steel, 265*D*.
steel in citric acid, 522*A*.
steel in citric acid, hydrogen diffusion, 527*A*.
steel in sulphuric acid, 523*A*.
theories, 517*A*, 518*A*.
theories, Evans', 519*A*.
theories, pore, 519*A*.
tinplate, 527*A*.
voltaic couples, 519*A*.
water mains, 525*A*.
welded plates, 516*A*.
wrought iron, 523*A*.
CORROSION COMMITTEE :
Third Report, 516*A*.
Third Report, discussion, 265*D*.
CORROSION-CRACKING, ferro-nickels in steam, 517*A*.
CORROSION-FATIGUE :
metals, 482*A*, 517*A*.
tin and zinc coatings, 526*A*.
CORROSION RATES :
compared with oxygen solubilities, 286*D*.
ratio, zinc and steel, 288*D*.
CORROSION-RESISTANCE :
chromium-nickel steel, 520*A*.
chromium steel, 520*A*.
CORROSION-RESISTANCE (*contd.*)—
nickel cast iron, 454*A*.
nickel-copper-chromium cast iron, 454*A*.
steel, effect of copper, 492*A*.
CORROSION-RESISTANT ALLOYS, properties, 490*A*, 517*A*.
CORROSION-RESISTANT CAST IRON, 453*A*.
CORROSION-RESISTANT STEEL :
cold-working, 517*A*.
heat treatment, 517*A*.
machining, 517*A*.
pickling, 517*A*.
properties, 514*A*.
welding, 517*A*.
CORROSION TESTS :
definition of sea water, 517*A*.
design and interpretation, 516*A*.
effect of immersion methods, 520*A*.
metals, 517*A*.
in sea water, 517*A*.
wire, 516*A*.
COSTING, foundry, 362*A*.
COSTS :
energy in rolling mills, 405*A*.
production, calculation, 405*A*.
COULOMETERS, use in electrodeposition, 438*A*.
COUNCIL, Report, 4.
CRANE HOOKS, design, 489*A*.
CRANES :
combined stripper and extractor, 384*A*.
electric, 383*A*.
CRANKSHAFTS, hardening surface, 414*A*.
CREEP :
chromium-molybdenum steel, 476*A*.
metals, 476*A*, 477*A*.
nickel-chromium steel, 476*A*.
steel, 477*A*.
steel, effect of composition and heat treatment, 474*A*.
CREEP LIMIT, determination, 475*A*.
CREEP STRENGTH, determination, 482*A*.
CREEP TEST FURNACE, 474*A*.
CRUCIBLE MELTING PRACTICE, 373*A*.
CRYSTALS :
metallic, properties, 498*A*.
metallic, transformation from face-centred to body-centred cubic lattice, 508*A*.
orientation, determination, 501*A*.
CUPOLA LININGS, life, 326*A*.
CUPOLA PRACTICE, 360*A*.
CUPOLAS :
carbon control, 360*A*.
reactions, 360*A*.
scrap additions, 361*A*.

CUPPING TESTS :
bibliography, 394*A*.
Jovignot, 393*A*.
National Physical Laboratory, 393*A*.
CUTTING, metals, 433*A*.
CUTTING PROCESS, Oxy-Ferrolene, 433*A*.
CUTTING TOOLS, carbide, manufacture, 435*A*.
CYANIDES, behaviour in blast-furnace, 357*A*.
CYLINDER LINERS :
nitriding, 414*A*.
properties, 448*A*.
CYLINDERS :
quenched, stresses, 419*A*.
steam, moulding, 367*A*.
CYMMER COLLIERY, coal-cleaning plant, 337*A*.

DAMPING CAPACITY, steel, effect of composition and heat-treatment, 481*A*.
DECARBURISATION :
cast iron by hydrogen, 449*A*.
catalytic, steel, 412*A*.
steel in reheating furnaces, 389*A*.
surface, chromium-vanadium steel, effect on impact resistance, 166*P*.
surface, silico-manganese steel, effect on impact resistance, 166*P*.
surface, spring steel, 129*P*.
surface, spring steel, effect on impact resistance, 166*P*.
DECOMPOSITION, thermal, iron carbide, 506*A*.
DEEP DRAWING :
sheets, 394*A*.
steel, manufacture, 376*A*.
DEFECTS :
alloy steel in hot state, 466*A*.
iron castings, 370*A*.
magnetic tests for, 496*A*.
steel castings, 369*A*, 371*A*.
surface, effect on dynamic strength of parts, 463*A*.
DEFORMATION :
elastic, pressed metal, 393*A*.
plastic, at holes in plates, 463*A*.
rate of, effect on steel, 485*A*.
steel in rolling, 402*A*.
viscous, wire, 462*A*.
DEOXIDATION :
effect on steel, ageing, 468*A*.
effect on steel, ferrite formation, 503*A*.
effect on steel, grain size, 502*A*.
effect on steel, impact strength at low temperatures, 478*A*.
DEOXIDATION (*contd.*)
steel, 378*A*.
steel by manganese, 380*A*.
steel by silicon, 380*A*.
DEPHOSPHORISATION, steel, Perrin process, 379*A*.
DESULPHURISATION, steel, 379*A*.
DE VOOYS' COAL-CLEANING PROCESS, 337*A*.
DICALCIUM FERRITE, dissociation pressure, 97*P*.
DIES :
pressing, alloy cast iron for, 392*A*.
wire-drawing, use of carbide, 407*A*.
DILATOMETER, magnetic, 474*A*.
DIRECT PROCESS, Krupp, 358*A*.
DISSOCIATION PRESSURES, ferric oxide and ferrites, 97*P*.
DONCASTER COALITE, LTD., carbonisation plant, 346*A*.
DORR CLASSIFIERS, 320*A*.
DRAWING :
cold, metals, 393*A*.
cold, requirements of materials, 394*A*.
cold, rods, effect of die shape, 394*A*.
deep, sheets, 394*A*.
effect on steel, 485*A*.
shells, 394*A*.
tubes, flow of material, 404*A*.
wire, 406*A*.
DREIBRITE CLEANING PROCESS, 435*A*.
DRIKOLD SHRINKING PROCESS, 434*A*.
DRYING, coal, 343*A*.
DUOFLEX CHECKERWORK, 352*A*.
DUPLEX PROCESS, history, 376*A*.
DURABILITY, increase by self-stresses, 482*A*.
DURAIN :
coking properties, 345*A*.
relation to cannel coal, 335*A*.
DUST CLOUDS, thermal radiation, 329*A*.

ELASTIC BEHAVIOUR :
metals, 474*A*.
springs, 458*A*.
ELASTIC DEFORMATION, pressed metal, 393*A*.
ELASTIC HYSTERESIS, cast iron, 447*A*.
ELASTIC MODULUS :
ferromagnetic materials, 458*A*.
metals, 458*A*.
silica bricks, 323*A*.
ELECTRIC DRIVES, design, 404*A*.
ELECTRIC DRIVING :
cleaning machines, 435*A*.
rolling mills, 403*A*.

ELECTRIC FURNACES :
high-frequency, calculations, 382*A*.
high-frequency, electrical equipment, 382*A*.
high-frequency, linings, 326*A*.
high-frequency, manufacture of high speed steel, 382*A*.
high-frequency, manufacture of steel, 382*A*.
induction, submerged resistor, 381*A*.
induction, Witton, 381*A*.
insulation, 327*A*.
manufacture of cast iron, 361*A*.
three-phase, reactance, 381*A*.
ELECTRIC MOTORS, for steel mills, 404*A*.
ELECTRIC POWER, for steel plants, 403*A*.
ELECTRICAL CONDUCTIVITY, metals, 474*A*.
ELECTRICITY :
use in German iron and steel plants, 331*A*.
use in iron and steel plants, 331*A*.
ELECTRODEPOSITION :
behaviour of complex salts, 439*A*.
cadmium, 438*A*, 518*A*.
cadmium-zinc alloys, 440*A*.
chromium, 438*A*, 439*A*, 518*A*.
effect of variation in anode and cathode efficiencies, 439*A*.
iron, 440*A*.
nickel, 438*A*.
nickel, effect of oxidising agents, 439*A*.
nickel-iron alloys, 439*A*.
throwing power of mixed electrolytes, 438*A*.
tin, 441*A*.
use of coulometers, 438*A*.
zinc, 438*A*, 441*A*.
ELECTRODES, welding, composition, 426*A*.
ELECTRO-FILTERS, 348*A*.
ELECTROGALVANISING, wire, 441*A*.
ELECTRON DIFFRACTION, 498*A*.
EMBRITTLEMENT, ageing, chromium steel, 469*A*.
EMERY PAPER, wear of iron alloys, 472*A*.
ENAMELLING :
cast iron, 444*A*.
steel tiles, 444*A*.
washing tubs, 444*A*.
ENAMELLING PLANT, lay-out, 444*A*.
ENAMELS :
effect of titanium oxide, 444*A*.
entrapped gases, 445*A*.
ENAMELS (*contd.*)—
properties and strength, 444*A*, 445*A*.
rust-resistant, 518*A*.
ENDURANCE IMPACT TESTS, stresses, 482*A*.
ENDURANCE PROPERTIES :
cast iron, effect of various factors, 479*A*.
steel, effect of various factors, 479*A*.
ENDURANCE TESTS :
boiler tubes, 482*A*.
cast iron, 482*A*.
screwed joints, 482*A*.
ENGLISH STEEL CORPORATION, forging plant, 391*A*.
EQUILIBRIUM DIAGRAM, four-component alloys, 509*A*.
EQUIPMENT, obsolete, replacement, 404*A*.
ESCO COPPER STEEL, 518*A*.
ETCHING REAGENTS, 449*A*.
for cementite, 499*A*.
EUROPE, early iron industry, 359*A*.
EVANS' THEORY of corrosion, 519*A*.
EXPANSION, thermal, iron-chromium alloys, 511*A*.
EXPANSION COEFFICIENT, cast iron, 449*A*.

FATIGUE :
carbon steel under repeated impact, 484*A*.
Chromador steel, 483*A*.
corrosion, metals, 482*A*, 517*A*.
corrosion, tin and zinc coatings, 526*A*.
machine parts, 479*A*.
metals, 484*A*.
metals, effect of notches, 479*A*.
metals at points of application of forces, 482*A*.
mild steel, 483*A*.
nickel-chromium steel, 476*A*.
steel, effect of composition and heat-treatment, 481*A*.
steel at high temperatures, 479*A*.
steel wire, 482*A*.
steel wire, effect of lubricants, 483*A*.
structural steel, 483*A*.
torsional, steel, effect of size and shape of test-piece, 481*A*.
welded joints, 430*A*.
FATIGUE RESISTANCE, spring steel, effect of surface decarburisation, 165*P*.

FATIGUE TESTING MACHINE, 518*A*.
FEEDING HEADS for moulds, 363*A*.
FEISTRITZ WORKS, history and development, 406*A*.
FERNGASGESELLSCHAFT SAAR, activities, 349*A*.
FERRAND GAS-CONTAINERS, 349*A*.
FERRIC OXIDE, dissociation pressure, 97*P*.
FERRITE FORMATION, steel, effect of deoxidation, 503*A*.
FERRITES, dissociation pressure, 97*P*.
FERRO-ALLOYS :
  degree of purity in steel making, 213*P*.
  determination of sulphur, 530*A*.
  non-metallic inclusions, 213, *Paper*.
FERROMAGNETIC MATERIALS, elastic modulus, 458*A*.
FERROMAGNETISM, theory, 496*A*.
FERRO-NICKELS, corrosion-cracking in steam, 517*A*.
FERROUS OXIDE, determination in steel, 528*A*.
FERTILISERS, use of blast-furnace slag, 358*A*.
FILES, manufacture, 435*A*.
FIRECLAY, permeability, 324*A*.
FISSURES, formation in heat treatment, 419*A*.
FLAKES :
  chromium-nickel steel, 385*A*.
  in steel, 384*A*, 385*A*.
FLAMES, thermal radiation, 329*A*.
FLOTATION, coal, 336*A*.
FLOW :
  commencement, dependence on stress distribution, 462*A*.
  gases in furnaces, 332*A*.
  gases, measurement, 332*A*.
  heat in coking process, 345*A*.
  material in tube drawing, 404*A*.
  plastic, metals, 474*A*.
FLUE DUST :
  injection in blast-furnace, Hescamp process, 355*A*.
  recovery of iodine, 357*A*.
FORD MOTOR CO., iron-ore properties, 317*A*.
FORGE FURNACES, 388*A*.
FORGING :
  boiler drums, 392*A*.
  car wheels, 392*A*.
  chain links, 392*A*.
  effect on steel, 486*A*.
FORGING HAMMERS, 392*A*.
FORGING PRACTICE, metallurgical control, 392*A*.
FORGING PRESSES, 391*A*.
FORGINGS :
  effect of grain size, 502*A*.
  nickel steel, segregation, 384*A*.
  structure and properties, 485*A*.
FOUNDRIES :
  distribution of work, 362*A*.
  handling materials, 370*A*.
  mechanised, 370*A*.
  planning, 370*A*.
  refractory materials, 326*A*.
FOUNDRY COKE, properties, 347*A*.
FOUNDRY COSTING, 362*A*.
FOUNDRY PATTERNS, re-use, 362*A*.
FOUNDRY PLANT :
  C. Akrill and Co., Ltd., 369*A*.
  Chevrolet Co., 360*A*, 363*A*, 370*A*.
  Griffin Wheel Co., 366*A*.
FOUNDRY PRACTICE, 360*A*.
  steel, 368*A*.
FRACTURE TEST, tool steel, 487*A*.
FRANCE :
  specifications for steel, 495*A*.
  zirconium ore deposits, 319*A*.
FREE-CUTTING STEEL, 487*A*.
FRICTIONAL WEAR, metals, 471*A*.
FUEL, analysis, 532*A*.
FURNACE WALLS, heat storage, 332*A*.
FURNACES :
  blast, *see* Blast-Furnaces.
  creep tests, 474*A*.
  control, 333*A*.
  flow of gases, 332*A*.
  forge, *see* Forge Furnaces.
  heat-treatment, *see* Heat-Treatment Furnaces.
  high-frequency, *see* Electric Furnaces.
  material balances, 328*A*.
  open-hearth, *see* Open-Hearth Furnaces.
  reheating, *see* Reheating Furnaces.
  rotary, for melting cast iron, 361*A*.
  thermal efficiency, 332*A*.
  thermotechnological calculations, 328*A*, 332*A*.
FUSION TEMPERATURE, coal ash, 328*A*.

GALVANISED COATINGS, types of spangles, 441*A*.
GALVANISING, electro-, wire, 441*A*.
GAS :
  analysis, confining liquids, 533*A*.
  analysis, slow-combustion pipette, 533*A*.
  cleaning, 348*A*.
  cleaning, Gyrepur apparatus, 348*A*.
  cleaning, Whessoe dedusting plant, 348*A*.

GAS (*contd.*)—
cleaning, W.W.D. electro-detarrer, 348*A*.
determination of benzol, 534*A*.
determination of water and hydrogen sulphide, 534*A*.
town, applications, 349*A*.
waste, analysis, 533*A*.
waste, moisture content, determination, 329*A*.
GAS CONTAINERS, autofrettaged, Ferrand system, 349*A*.
GAS ENGINES, *versus* steam turbines, 331*A*.
GAS-HOLDERS, 349*A*.
GAS PRODUCERS, *see* Producers.
GASES :
compressed, transport, 349*A*.
flow in furnaces, 332*A*.
flow, measurement, 332*A*.
mixing, 333*A*.
physical state, effect of humidity, 330*A*.
thermal radiation, 329*A*.
GATES, for moulds, 363*A*.
GEARS, heat treatment, 417*A*.
GENERAL REFRACTORIES, LTD., plant, 322*A*.
GERMANY :
bauxite deposits, 316*A*.
brown coal deposits, 316*A*.
electricity in steel plants, 331*A*.
iron ore deposits, 316*A*.
manufacture of chilled castings, 366*A*.
metal industries, 358*A*.
phosphorite deposits, 316*A*.
specification for chains, 495*A*.
welding technique, 421*A*.
GIBBONS-KOGAG COKE-OVENS, 340*A*.
GIRDERS :
cast iron, tests, 447*A*.
welded-plate, 424*A*.
GLASS SILK, use for insulation, 327*A*.
GLAZUNOV METHOD of determining weight of coatings, 442*A*.
GOLDSCHMIDT FLUES for coke-ovens, 344*A*.
GRAIN GROWTH, metals, 503*A*.
GRAIN SIZE :
effect on forgings, 502*A*.
metals, 498*A*.
steel, 380*A*.
steel, effect of deoxidation, 502*A*.
GRAPHITE :
formation in cast iron, 451*A*.
solution rate in cast iron, 451*A*.
GREENAWALT SINTERING PLANT, 320*A*.
GREY METHOD of rolling beams, 399*A*.
GRIFFIN-GALE TESTING MACHINE, 457*A*.
GRIFFIN WHEEL CO., foundry plant, 366*A*.
GRINDING MACHINES, 405*A*.
GROWTH :
cast iron, effect of phosphorus, 452*A*.
cast iron, effect of special mixtures, 452*A*.
GRÜNEWALD SYSTEM of bright annealing, 415*A*.
GUIDE BOXES, for rod mills 399*A*.
GUN, taphole, for blast-furnaces, 351*A*.
GUSSOLIT PROCESS, 443*A*.
GYREPUR GAS-CLEANING APPARATUS, 348*A*.

HANDLING :
iron ore, 320*A*.
materials in foundries, 370*A*.
HANFFSTENGEL WEAR TESTING MACHINE, 471*A*.
HARDENED STEEL, carbides, 504*A*.
HARDENING :
age, metals, 467*A*, 498*A*.
age-, theory, 468*A*.
ball-bearing races, 418*A*.
cast iron, 414*A*.
chromium steel, 509*A*.
precipitation, metals, 467*A*, 485*A*.
precipitation, relation to martensitic hardening, 467*A*.
surface, cast iron, 414*A*.
surface, crankshafts, 414*A*.
tool steel, 417*A*.
vanadium steel, 418*A*.
HARD-FACING, materials, 433*A*.
HARDNESS :
Brinell, relation to scratch hardness, 470*A*.
carburised steel, 469*A*.
steel, effect of carbon, 472*A*.
HARDNESS NUMBERS, conversion tables, 470*A*.
HARDNESS TESTING MACHINES, 469*A*, 470*A*.
HEAT :
flow in coking process, 345*A*.
specific, cementite, 513*A*.
specific, iron-carbon alloys, 513*A*.
specific, metals, 513*A*.
waste, utilisation, 330*A*, 331*A*.
HEAT EXCHANGE, open-hearth furnaces, 377*A*.
HEAT OF FORMATION, iron phosphide, 356*A*.

HEAT-LOSS :
blast-furnace, effect of bosh tuyeres, 59*P*.
blast furnace, effect of cooling winds, 59*P*.
blast-furnace, effect of exposed sites, 59*P*.
blast-furnace, effect of life of lining, 59*P*.
blast-furnace, effect of rate of drive, 59*P*.
blast-furnace, effect of water cooling, 59*P*.
blast-furnaces, 59, *Paper*.
HEAT-RESISTANT ALLOYS, properties, 490*A*.
HEAT-RESISTANT STEEL :
properties, 514*A*.
welding, 425*A*.
HEAT STORAGE, furnace walls, 332*A*.
HEAT TRANSMISSION, 329*A*.
boilers, 330*A*.
HEAT TREATMENT :
cast iron, 421*A*.
corrosion-resistant steel, 517*A*.
effect on cobalt-chromium steel, 510*A*.
effect on cobalt-manganese steel, 510*A*.
effect on manganese-chromium steel, 510*A*.
effect on steel, 486*A*.
effect on steel, creep strength, 474*A*.
effect on steel, fatigue and damping capacity, 481*A*.
formation of fissures, 419*A*.
gears, 417*A*.
magnetic materials, 417*A*.
nickel-chromium steel, 420*A*.
spring steel, 129*P*.
steel, 415*A*.
steel castings, 417*A*.
vanadium steel, 418*A*.
HEAT TREATMENT FURNACES :
controlled atmospheres, 416*A*.
electric, 410*A*.
electric, air circulation, 411*A*.
gas-fired, 410*A*.
oil-fired, 410*A*.
for springs, 411*A*.
HEATING :
immersion, utilisation, 331*A*.
steel, time required, 389*A*.
HESCAMP PROCESS, 355*A*.
HETEROGENEITY, solid solutions, 522*A*.
HIGH-FREQUENCY FURNACES, *see* Electric Furnaces.
HIGH-SPEED STEEL :
manufacture in electric furnaces, 382*A*.
properties, 382*A*, 490*A*.
HISTORY :
duplex process, 376*A*.
iron, 359*A*.
wire drawing, 406*A*.
H.K. PIG IRON, 452*A*.
HOLES, effect on stress concentration, 464*A*.
HOLLAND, blast-furnace slag as fertilisers, 358*A*.
HOOKS, specification, British, 494*A*.
HUMIDITY, effect on gases, physical state, 330*A*.
HYDROGEN :
decarburisation of cast iron, 449*A*.
diffusion in corrosion of steel, 527*A*.
effect on weld metal, 425*A*.
HYDROGEN PEROXIDE, effect in nickel deposition, 439*A*.
HYDROGEN SULPHIDE, determination in gas, 534*A*.
HYDROGENISATION :
coal, 350*A*.
tar, 350*A*.
HYDROGENISATION PLANT, 350*A*.

IMPACT, repeated, fatigue of steel, 484*A*.
IMPACT-BEND TESTS, cast iron, effect of testing temperature, 448*A*.
IMPACT RESISTANCE :
chromium-vanadium steel, effect of surface decarburisation, 166*P*.
silico-manganese steel, effect of surface decarburisation, 166*P*.
spring steel, 165, *Paper*.
IMPACT STRENGTH :
evaluation, 461*A*.
steel at low temperatures, effect of deoxidation, 478*A*.
IMPACT TESTS, 460*A*.
allowable stresses, 461*A*.
endurance, stresses, 482*A*.
steel, relation to tensile tests, 459*A*.
IMPACT VALUES, irregular, 460*A*.
INCLUSIONS :
non-metallic, ferro-alloys, 213, *Paper*.
separation in liquid steel, 386*A*.
slag, steel, 213*P*.
INDIA, pipe casting, 367*A*.
INGOT MOULDS :
production, 367*A*.

INGOT MOULDS (*contd.*)
thickness, effect on ingot structure, 384*A*.
INGOTS :
rimmed, properties, 384*A*.
solidification, 384*A*.
stripping, 384*A*.
structure, 386*A*.
structure, effect of mould thickness, 384*A*.
INHIBITORS, action in pickling solutions, 437*A*.
INLAND STEEL CO., strip mills, 401*A*.
INSULATING BRICK :
manufacture, 327*A*.
thermal conductivity, 324*A*.
INSULATING MATERIAL :
glass silk, 327*A*.
properties, 326*A*, 327*A*.
INSULATION :
electric furnaces, 327*A*.
open-hearth furnaces, 327*A*.
use of steel sheets, 330*A*.
IODINE, recovery from blast-furnace flue dust, 357*A*.
IODINE METHOD, determination of oxides, 249, *Paper*.
IRIS VALVE MIXING STATION, 333*A*.
IRON :
analysis, 528*A*.
ancient, Scotland, 359*A*.
arc-spectrum, measurement, 501*A*.
electrodeposition, 440*A*.
history, 359*A*.
magnetostriction, 496*A*.
nitriding, 413*A*.
notch toughness, effect of impurities, 461*A*.
scaling, effect of oxygen and sulphur, 181, *Paper*.
separation, benzoate method, 532*A*.
solubility of copper, 468*A*.
solubility of nitrogen, 467*A*.
temper colours, 420*A*.
thermal and electrical conductivities, 474*A*.
transformations, 508*A*.
IRON ALLOYS, wear, 472*A*.
IRON-ALUMINIUM ALLOYS, transformations, 225, *Paper*.
IRON CARBIDE :
specific heat, 513*A*.
thermal decomposition, 506*A*.
IRON-CARBON ALLOYS, specific heat, 513*A*.
IRON-CHROMIUM ALLOYS :
effect of nitrogen, 511*A*.
properties, 511*A*.
thermal expansion, 511*A*.
IRON-CHROMIUM ALLOYS (*contd.*)—
transformations, 511*A*.
IRON-CHROMIUM-CARBON DIAGRAM, 509*A*.
IRON-CHROMIUM DIAGRAM, 511*A*.
IRON - CHROMIUM - NITROGEN SYSTEM 512*A*.
IRON-CHROMIUM SYSTEM, 512*A*.
IRON-COBALT-TITANIUM SYSTEM, 512*A*.
IRON-COPPER ALLOYS, ageing, lattice changes, 468*A*.
IRON INDUSTRIES :
Russia, 359*A*.
United States, 351*A*.
IRON/IRON - OXIDE/CALCIUM - ORTHOFERRITE SYSTEM, 383*A*.
IRON/IRON - SULPHIDE/MANGANESE-SULPHIDE/MANGANESE SYSTEM, 491*A*.
IRON-NICKEL ALLOYS, magnetic properties, 467*A*.
IRON-NITROGEN DIAGRAM, 427*A*.
IRON ORE :
burdening for blast-furnace, 354*A*.
dressing, use of mechanical classifiers, 320*A*.
handling, 320*A*.
magnetic concentration, 320*A*.
magnetic separation, 321*A*.
transport, 320*A*.
valuation, 320*A*.
zinc-bearing, recovery of zinc, 357*A*.
IRON ORE DEPOSITS :
Germany, 316*A*.
Puerto Rico, 317*A*.
United States, 317*A*.
Yugoslavia, 316*A*.
IRON ORE MINES, aerial ropeways, 320*A*.
IRON OXIDE, control in basic process, 380*A*.
IRON-OXIDE/LIME/SILICA System, 383*A*.
IRON PHOSPHIDE, heat of formation, 356*A*.
IRON-SULPHIDE/MANGANESE EQUILIBRIUM, 379*A*.
IRON WIRE, viscosity, 462*A*.
IRON-ZINC ALLOYS, high crystallisation force, 513*A*.

JAPAN, magnesite deposits, 318*A*.
JOINTS, screwed, endurance tests, 482*A*.
JOVIGNOT CUPPING TEST, 393*A*.

KINEMATOGRAPHY, for metallographic work, 500*A*.

KNOWLES COKING PROCESS, 346*A*.
KRUPP DIRECT PROCESS, 358*A*.

LACQUERED STEEL, corrosion, 527*A*.
LADLES, slag, production, 367*A*.
LAHN DISTRICT, mineral deposits, 164.
"L. AND N." CARBONISATION PROCESS, 346*A*.
LESSING COAL CLEANING PROCESS, 337*A*.
LIME/FERRIC-OXIDE DIAGRAM, 92*P*.
LININGS :
  cupola, 326*A*.
  high-frequency furnaces, 326*A*.
LIQUID COAL, Wyndham process, 350*A*.
LITHIUM, effect in steel and cast iron, 493*A*.
LOADED MATERIALS, phenomena taking place, 458*A*.
LODGE - COTTRELL GAS-CLEANING-PLANT, 349*A*.
LOEFFLER SYSTEM OF STEAM GENERATION, 330*A*.
LUBRICANTS, effect on steel wire, fatigue, 483*A*.
LUBRICATION :
  bearings, 397*A*.
  in wire-drawing, 397*A*.
LUKENS STEEL CO., manufacture of nickel-clad steel, 445*A*.
LYSAGHT, JOHN, LTD., metal mixer, 375*A*.

MACHINABILITY, structural steel, 473*A*.
MACHINING :
  automobile steel, 473*A*.
  corrosion-resistant steel, 517*A*.
MADAGASCAR, zirconium ore deposits, 319*A*.
MAGNAFLUX TEST, 463*A*.
MAGNESIDON BRICKS, open-hearth furnaces, 325*A*.
MAGNESITE BRICKS, *see* Refractory Bricks.
MAGNESITE DEPOSITS :
  Japan, 318*A*.
  Manchukuo, 318*A*.
  Norway, 318*A*.
  Rusia, 318*A*.
  Sweden, 318*A*.
MAGNET STEEL :
  casting, 367*A*.
  cobalt, properties, 498*A*.
  nickel-aluminium, properties, 497*A*.
  properties, 490*A*, 497*A*.
  tungsten, effect of annealing, 497*A*.
MAGNETIC-ACOUSTIC TESTS, 499*A*.
MAGNETIC CONCENTRATION, iron ore, 320*A*.
MAGNETIC MATERIALS :
  heat-treatment, 417*A*.
  properties, 495*A*.
MAGNETIC PERMEABILITY, measurement, 495*A*.
MAGNETIC PROPERTIES :
  iron-nickel alloys, 467*A*.
  iron and steel, 496*A*.
  nickel-iron alloys, 498*A*.
  thermoperm, 496A.
  silicon steel, 498*A*.
MAGNETIC SEPARATION, iron ore, 321*A*.
MAGNETIC TESTS, 496*A*, 499*A*.
MAGNETOSTRICTION, iron, nickel and cobalt, 496*A*.
MAGNETS, use of nickel alloys, 496*A*.
MALLEABLE CAST IRON :
  effects of copper, 455*A*.
  incompatibility between tensile strength and elongation, 455*A*.
  manufacture, 369*A*.
  properties, 455*A*.
  short-cycle anneal, 369*A*.
MANCHUKUO, magnesite deposits, 318*A*.
MANGANESE :
  deoxidation of steel, 380*A*.
  determination in steel, spectrophotometric method, 531*A*.
  effect in steel, 492*A*.
  effect in steel, creep strength, 475*A*.
  effect in steel, resilience, 491*A*.
MANGANESE-CHROMIUM STEEL, effect of heat treatment, 510*A*.
MANGANESE - COPPER - IRON - NICKEL DIAGRAM, 509*A*.
MANGANESE OXIDE :
  determination in steel, 528*A*.
  reduction in molten iron, 356*A*.
MANGANESE STEEL :
  cast, properties, 491*A*.
  effect of composition, heat-treatment and degree of forging, 486*A*.
  notch-sensitiveness under alternating stress, 480*A*.
  properties, 490*A*.
  temper-brittleness, 420*A*.
MANGANESE - SULPHIDE/IRON EQUILIBRIUM, 379*A*.
MANIPULATORS, for rolling mills, 405*A*.
MARQUETTE, iron ore deposits, 317*A*.
MARTENSITE :
  cubic, effect of silicon, stability, 506*A*.
  structure, 507*A*.
MEEHANITE CASTINGS, production, 367*A*.

MEIER METHOD of rolling beams, 399*A*.
MEMBERS, election, 1.
METALLOGRAPHY at low temperatures, 499*A*.
MICROMACHINES for testing, 457*A*.
MICROSCOPES :
  electron, 499*A*.
  illumination, 500*A*.
  Panphot, 500*A*.
  polarisation, 499*A*.
MICROSCOPICAL EXAMINATION :
  basic slag, 383*A*.
  coal dust, 339*A*.
MILD STEEL :
  effect of temperature and deformation rate, 485*A*.
  fatigue, 483*A*.
  overstraining, 465*A*.
MILL SCALE, effect on paint performance, 516*A*.
MILLING TEST, weld metal, 499*A*.
MINERAL RESOURCES, 316*A*.
MINES, corrosion of sleepers, 517*A*.
MIXERS, 375*A*.
MODULUS OF ELASTICITY :
  ferromagnetic materials, 458*A*.
  metals, 458*A*.
  silica bricks, 323*A*.
MOHR'S THEORY for evaluating strength of cast iron, 448*A*.
MOISTURE, determination in waste gas, 329*A*.
MOLL CHECKERWORK, 375*A*.
MOLYBDENUM :
  determination in steel, 529*A*.
  determination in steel in presence of tungsten, 529*A*.
  effect in cast iron, 455*A*.
  effect in steel, 485*A*.
  effect in steel, case-hardening, 412*A*.
  effect in steel, creep strength, 475*A*.
MOLYBDENUM STEEL :
  burning, 389*A*.
  properties, 490*A*.
MONELL PROCESS of steelmaking, 376*A*.
MONOCALCIUM-FERRITE, dissociation pressure, 97*P*.
MOTOR CAR ROOFS, pressing, 393*A*.
MOULDING MACHINES, 363*A*.
MOULDING PRACTICE, 366*A*.
MOULDING SAND :
  control, 365*A*.
  dry sand strength, 365*A*.
  gas permeability, 365*A*.
  properties and tests, 364*A*.
MOULDS :
  gates, risers and feeding heads, 363*A*.
  permanent, 363*A*.
  use of coal dust, 365*A*.
NATIONAL PHYSICAL LABORATORY CUPPING TEST, 393*A*.
NATURAL GAS, thermal radiation from flames, 329*A*.
NETTLETON TOP MINES, aerial ropeway, 320*A*.
NEW MEXICO, coal deposits, 317*A*.
NICKEL :
  determination in nickel plating baths, 531*A*.
  effect in cast iron, expansion coefficient, 449*A*.
  effect in steel, case-hardening, 412*A*.
  effect in steel, scaling and red-shortness, 492*A*.
  electrodeposition, 438*A*.
  electrodeposition, effect of oxidising agents, 439*A*.
  magnetostriction, 496*A*.
NICKEL ALLOYS, use for magnets, 496*A*.
NICKEL-ALUMINIUM MAGNET STEEL, properties, 497*A*.
NICKEL CAST IRON :
  corrosion resistance, 454*A*.
  effect of antimony, 454*A*.
NICKEL - CHROMIUM - MOLYBDENUM STEEL, use for valves, 515*A*.
NICKEL-CHROMIUM STEEL :
  creep, 476*A*.
  fatigue, 476*A*.
  heat treatment, 420*A*.
  notch sensitiveness under alternating stress, 480*A*.
  properties, 485*A*, 490*A*.
  use in aircraft construction, 493*A*.
  welding, 425*A*.
NICKEL - CLAD STEEL, manufacture, 445*A*.
NICKEL COATINGS :
  corrosion, 526*A*.
  structure and properties, 439*A*.
NICKEL-COPPER-CHROMIUM CAST IRON, corrosion resistance, 454*A*.
NICKEL-IRON ALLOYS :
  electrodeposition, 439*A*.
  magnetic properties, 498*A*.
NICKEL NITRATE, effect in nickel deposition, 439*A*.
NICKEL PLATING BATHS, determination of nickel and chlorides, 531*A*.
NICKEL STEEL :
  burning, 389*A*.
  effect of composition, heat-treatment and degree of forging, 486*A*.
  notch-sensitiveness under alternating stress, 480*A*.
  quenched, stresses, 419*A*.
  segregation, 384*A*.

NICKEL STEEL (*contd.*)—
temper-brittleness, 420*A*.
use for valves, 515*A*.
NICKEL WIRE, viscosity, 462*A*.
NICKEL WROUGHT IRON, properties, 494*A*.
NICROSILAL, composition, 453*A*.
NIRESIST, composition, 453*A*.
NITRICASTIRON, centrifugal casting, 368*A*.
NITRIDING :
cast iron, 413*A*.
chromium - molybdenum - vanadium steel, 413*A*.
cylinder liners, 414*A*.
iron, 413*A*.
metals, 485*A*.
steel, effect of aluminium and chromium, 413*A*.
NITRIDING FURNACES, electric, 410*A*.
NITRIDING STEEL, properties, 490*A*.
NITROGEN :
determination in steel, 530*A*.
effect in iron, notch toughness, 461*A*.
effect in iron-chromium alloys, 511*A*.
effect in steel, ageing, 469*A*.
effect in weld metal, 426*A*, 427*A*.
in slags, 383*A*.
solubility in iron, 467*A*.
NORMALISING, bright, sheet and strip, 411*A*.
NORWAY, magnesite deposits, 318*A*.
NOTCH SENSITIVENESS :
steel under alternating stress, 480*A*.
steel at high temperatures, 479*A*.
NOTCH TOUGHNESS, iron, effect of impurities, 461*A*.
NOTCHED BARS, bend tests, 459*A*.
NOTCHED PLATES, stress distribution, 467*A*.
NOTCHES :
effect on metals, fatigue, 479*A*.
effect on stress concentration, 464*A*.

OIL FUEL :
from coal, 350*A*.
use in industrial furnaces, 350*A*.
OIL REFINERIES :
ageing embrittlement of chromium steel, 469*A*.
use of chromium steel, 516*A*.
OIL TANKERS, corrosion, 524*A*.
OPEN-HEARTH FURNACES :
air infiltration, 375*A*.
basic, manufacture of deep-drawing steel, 376*A*.
heat exchange, 377*A*.
insulation, 327*A*.
OPEN-HEARTH FURNACES (*contd.*)
lining and maintenance costs, 374*A*.
refractory bricks, 325*A*.
regenerators, Moll checkerwork, 375*A*.
silica bricks, 326*A*.
OPEN-HEARTH PRACTICE, 376*A*.
OPEN-HEARTH PROCESS :
acid, reactions, 377*A*.
basic, iron oxide control, 380*A*.
basic, reactions, 377*A*.
slag composition, estimation, 380*A*.
ORES, analysis, 532*A*.
OVERHEATING, boiler plate, 487*A*.
OVERSTRAINING, mild steel, 465*A*.
OVERSTRESSING, boiler plates, 466*A*.
OXIDATION, refractory materials, effect of alumina-silica ratio, 323*A*.
OXIDATION WEAR, metals, 471*A*.
OXIDES :
determination in steel, 528*A*.
determination in steel, iodine method, 249, *Paper*.
in steel, 379*A*.
OXY-FERROLENE CUTTING PROCESS, 433*A*.
OXYGEN :
effect in iron, notch toughness, 461*A*.
effect in iron, scaling, 181*P*.
effect in steel, ageing, 469*A*.
use in blast-furnaces, 354*A*.
OXYGEN SOLUBILITIES, compared with corrosion rates, 286*D*.

PAINT :
metal priming, 446*A*.
performance, effect of mill scale, 516*A*.
for steelwork, 446*A*.
PANPHOT MICROSCOPE, 500*A*.
PATTERNMAKING, 362*A*.
PATTERNS :
foundry, re-use, 362*A*.
foundry, use of plaster, 363*A*.
PEARLITE, lamellar, structure and formation, 505*A*.
PERMALLOY, heat treatment, 417*A*.
PERMEABILITY :
fireclay, 324*A*.
magnetic, measurement, 495*A*.
moulding sand, 365*A*.
PERRIN DEPHOSPHORISATION PROCESS, 379*A*.
PHOSPHORIC ACID, production in blast-furnaces, 357*A*.
PHOSPHORITE DEPOSITS, Germany, 316*A*.

PHOSPHORUS :
behaviour in blast-furnace, 335*A*.
in coal and coke, 335*A*.
effect in cast iron, growth, 452*A*.
effect in iron, notch toughness, 461*A*.
effect in steel, 491*A*.
effect in steel, case-hardening, 412*A*.
PHOTO-ELASTIC METHOD of stress determination, 465*A*.
PHOTOTUBE CONTROL DEVICE, 403*A*.
PICKLING :
Bullard-Dunn process, 436*A*.
corrosion-resistant steel, 517*A*.
metals, 517*A*.
steel, 436*A*.
surface cracking of steel castings, 438*A*.
PICKLING EQUIPMENT, use of rubber-faced rolls, 436*A*.
PICKLING SOLUTIONS :
action of inhibitors, 437*A*.
reclamation, 437*A*.
PIG IRON :
cold-blast, properties, 448*A*.
manufacture, 351*A*.
structure, effect of slag control, 449*A*.
PILING :
sheet, corrosion, 523*A*.
sheet, use of Resista steel, 488*A*.
PIPES :
bituminous, coatings, 445*A*.
corrosion, 519*A*, 524*A*, 525*A*.
moulding, 367*A*.
welding, 422*A*.
PISTON CORES, centrifugal casting, 368*A*.
PITCH, briquette, tests, 339*A*.
PLASTER, use for foundry patterns, 363*A*.
PLATE MILLS, 398*A*.
roll deflection, 115*P*, 399*A*.
PLATES :
boiler, overheating, 487*A*.
boiler, overstressing, 466*A*.
boiler, stresses, 466*A*.
heating, time required, 389*A*.
notched, stress distribution, 467*A*.
perforated, plastic deformation, 463*A*.
perforated, stress concentration, 464*A*.
ship, corrosion, 516*A*.
thickness determination, 521*A*.
PLATING BATHS :
determination of chromium, 531*A*.
determination of nickel and chlorides, 531*A*.
POLISHING, metals, 434*A*.
POURBAIX THEORY of corrosion, 519*A*.
POROSITY, steel castings, 371*A*, 372*A*.
PORTS, Wellman-Soward, 376*A*.
POTASH, recovery in blast-furnace, 357*A*.
POWDERS, metal, sintering, 436*A*.
POWER, electric, for steel plants, 403*A*.
PRECIPITATION HARDENING :
metals, 467*A*, 485*A*.
relation to martensitic hardening, 467*A*.
PRECIPITATION PROCESSES, during tempering, 420*A*.
PRESIDENT, induction of Sir Harold Carpenter, 27.
PRESIDENTIAL ADDRESS, Sir Harold Carpenter, 35.
PRESSED METAL, elastic deformation, 393*A*.
PRESSES, for sheets, 393*A*.
PRESSING :
cold, metals, 393*A*.
cold, requirements of materials, 394*A*.
motor car roofs, 393*A*.
PRESSING DIES, alloy cast iron for, 392*A*.
PRESSURE VESSELS :
effect of openings, 464*A*.
welding, 423*A*, 424*A*.
PRODUCER GAS, purification, 348*A*.
PRODUCER PRACTICE, 347*A*.
PRODUCERS :
use of coke, 347*A*.
use of turbo-blowers, 347*A*.
PROPANE, utilisation, 350*A*.
PUERTO RICO, iron ore deposits, 317*A*.
PUPPE METHOD of rolling beams, 399*A*.
PYROGALLOL, for etching cementite, 499*A*.
PYROMETRY, 409*A*.

QUENCHED CYLINDERS, stresses, 419*A*.
QUENCHING PHENOMENA, study by high-speed photography, 418*A*.

RADIATION, thermal, 329*A*.
RAIL STEEL, manufacture, slag control, 380*A*.
RAILS :
breakage, 488*A*.
specification, British, 494*A*.
straightening, 405*A*.
wear, 472*A*.
wrought iron, examination, 517*A*.
RAZOR BLADES, cold-rolling and annealing, 417*A*.

REACTIONS, open-hearth process, 377*A*.
REACTIVITY, coke, 347*A*.
RECRYSTALLISATION, metals, 498*A*.
RECUPERATORS, use of silicon carbide, 327*A*.
RED-SHORTNESS, steel, effect of copper and nickel, 492*A*.
REFRACTORY BRICK :
  chrome, thermal conductivity, 324*A*.
  chrome-magnesite, open-hearth furnaces, 325*A*.
  fireclay, thermal conductivity, 324*A*.
  magnesidon, open-hearth furnaces, 325*A*.
  magnesite, burning, 322*A*.
  magnesite, thermal conductivity, 324*A*.
  manufacture, 322*A*.
  open-hearth furnaces, 325*A*.
  rubinit, open-hearth furnaces, 325*A*.
  silica, modulus of elasticity, 323*A*.
  silica, open-hearth furnaces, 325*A*, 326*A*.
  silica, thermal conductivity, 324*A*.
REFRACTORY MATERIALS :
  coke-ovens, 324*A*, 325*A*.
  fireclay, permeability, 324*A*.
  foundries, 326*A*.
  manufacture, 322*A*.
  oxidation, effect of alumina/silica ratio, 323*A*.
  properties and tests, 322*A*.
  thermal conductivity, 324*A*.
REGENERATORS, Moll checkerwork, 375*A*.
REGULATORS, 333*A*.
  for high temperatures, 410*A*.
  photo-electric, 334*A*.
REHEATING FURNACES, 388*A*.
  losses by burning and decarburisation, 389*A*.
  temperature control, 390*A*.
  thermal efficiency, 332*A*.
RESISTA STEEL, use for sheet piling, 488*A*.
REYNOLDS NUMBER, 332*A*.
RIMMING STEEL :
  manufacture, slag control, 380*A*.
  properties, 384*A*.
  teeming, 376*A*.
RISERS for moulds, 363*A*.
ROD MILLS, guide boxes, 399*A*.
RODS :
  cold-drawing, effect of die shape, 394*A*.
  polished, self-stresses, 463*A*.
ROHN ROLLING MILL, 400*A*.
ROLL COLLARS, use, 395*A*.
ROLLING :
  beams, broad-flange, 399*A*.
  blackplate, 402*A*.
  cold, metals, 400*A*.
  cold, razor blades, 417*A*.
  deformation of steel, 402*A*.
  flat stock, 399*A*.
  liquid steel, 403*A*.
  sheets, 402*A*.
  speed, measurement, 395*A*.
  tinplate, 402*A*.
ROLLING-MILL PLANT :
  Aciéries de Micheville, 398*A*.
  Colvilles, Ltd., 398*A*.
  Inland Steel Co., 401*A*.
  Tata Iron and Steel Co., 399*A*.
  Whitehead Iron and Steel Co., Ltd., 398*A*.
  Youngstown Sheet and Tube Co., 351*A*, 400*A*.
ROLLING-MILL PRACTICE, 395*A*.
ROLLING MILLS :
  backed-up, 400*A*.
  bearings, 396*A*.
  billet, 398*A*.
  blooming, electric driving, 403*A*.
  cold, design, 400*A*.
  collared, 395*A*.
  control instruments, 403*A*.
  costs of energy, 405*A*.
  design, 398*A*.
  lubrication, 398*A*.
  manipulators, 405*A*.
  plate, 398*A*.
  plate, roll deflection, 399*A*.
  precision, 403*A*.
  pressures, recording apparatus, 396*A*.
  rod, guide boxes, 399*A*.
  Rohn, 400*A*.
  rolls, deflection, 115, *Paper*.
  sheet, 400*A*, 401*A*.
  sheet, American, 400*A*, 401*A*.
  sheet, roll deflection, 399*A*.
  sheet bar, 399*A*.
  strip, 400*A*, 401*A*.
  strip, American, 400*A*, 401*A*.
  strip, conveying machines, 406*A*.
  strip, design, 400*A*.
  strip, roll deflection, 399*A*.
  time-studies, 404*A*, 405*A*.
ROLLS :
  cast steel, manufacture, 395*A*.
  chilled, alloy, manufacture, 366*A*.
  deflection, 115, *Paper*, 399*A*.
  grinding, 405*A*.
  measurement of surface temperature, 395*A*.
ROPEWAYS, aerial, at iron mines, 320*A*.
ROTOR, cast steel, manufacture, 368*A*.

ROUGHNESS, measurement, 473*A*.
RUBBER, adhesion to metal, 446*A*.
RUBINIT BRICKS, open-hearth furnaces, 325*A*.
RUHR COAL, decomposition, 335*A*.
RUSSIA :
  blast-furnace design, 351*A*.
  iron industry, 359*A*.
  magnesite deposits, 318*A*.

SAAR DISTRICT, gas industry, 349*A*.
SACH'S BORING-OUT METHOD, 463*A*.
SACK METHOD of rolling beams, 399*A*.
SAMPLING, coal, 532*A*.
SANDBLASTING MACHINES, 434*A*.
SANDVIK RUSTLESS STEEL, 518*A*.
SAVILLE, J. J. & Co., plant, 435*A*.
SAWING, metals, performance of cutting fluids, 436*A*.
SCALE, effect on paint performance, 516*A*.
SCALED STEEL, structure, 181*P*.
SCALING :
  iron, effect of oxygen and sulphur, 181, *Paper*.
  steel, 389*A*, 390*A*, 415*A*.
  steel, effect of copper and nickel, 492*A*.
SCHLIHA PROCESS of spraying metals, 444*A*.
SCHOOP PROCESS of metal spraying, 441*A*, 518*A*.
SCHURY FURNACE, superheating of cast iron, 361*A*.
SCOTLAND, ancient iron, 359*A*.
SCRAP :
  use in blast-furnaces, 355*A*.
  use in cupolas, 361*A*.
SCRATCH HARDNESS, relation to Brinell hardness, 470*A*.
SCRATCHES, uniform, production on metal surfaces, 521*A*.
SCREWED JOINTS, endurance tests, 482*A*.
SEA WATER :
  corrosion tests, 517*A*.
  definition for corrosion tests, 517*A*.
SEGREGATION, nickel-steel forgings, 384*A*.
SELSYN ELECTRICAL DEVICE, 403*A*.
SENEGAL, zirconium ore deposits, 319*A*.
SHEAR TESTS, metals, effect of fluid pressure, 461*A*.
SHEET-BAR MILL, 399*A*.
SHEET MILLS, 400*A*, 401*A*.
  American, 400*A*, 401*A*.
  roll deflection, 115*P*, 399*A*.
SHEET PILING :
  corrosion, 523*A*.
  use of Resista steel, 488*A*.
SHEET STEELS, high-strength, 488*A*.
SHEETS :
  box annealing, 416*A*.
  bright normalising, 411*A*.
  cold-pressing, 393*A*.
  cupping tests, 393*A*.
  deep-drawing, 394*A*.
  plated, manufacture, 445*A*.
  presses for, 393*A*.
  rolling, 402*A*.
  transformer, specification, British, 495*A*.
  use for insulation, 330*A*.
SHELLS, drawing, 394*A*.
SHERARDISING, 441*A*.
SHIP PLATES, corrosion, 516*A*.
SHIPS, corrosion, 272*D*, 281*D*, 524*A*.
SHORTER HARDENING PROCESS, 414*A*.
SHRINKAGE, iron castings, 371*A*.
SHRINKING :
  metals, 434*A*.
  metals, frictional resistance of steel and brass, 434*A*.
SHRINKING PROCESS, Drikold, 434*A*.
SIEGERLAND, iron ore deposits, 316*A*.
SILAL, composition, 453*A*.
SILICA BRICKS, *see* Refractory Bricks.
SILICO-MANGANESE STEEL :
  surface decarburisation, 129*P*.
  surface decarburisation, effect on impact resistance, 166*P*.
SILICON :
  deoxidation of steel, 380*A*.
  determination in steel, 530*A*.
  determination in steel, photometric method, 530*A*.
  effect on cubic martensite, stability, 506*A*.
  effect in steel, 491*A*.
  effect in steel, case-hardening, 412*A*.
  effect in steel, creep strength, 475*A*.
  metallurgical applications, 491*A*.
  reactions with sulphur, 357*A*.
SILICON CARBIDE, use for recuperators, 327*A*.
SILICON-IRON CASTINGS, 518*A*.
SILICON STEEL :
  bright annealing, 416*A*.
  magnetic properties, 498*A*.
  notch-sensitiveness under alternating stress, 480*A*.
  properties, 490*A*.
"SILIKAKALK," 358*A*.
SINTERING, metal powders, 436*A*.
SINTERING PLANT, Greenawalt, 320*A*.
SLABS, heating, time required, 389*A*.

SLAG :
basic, microscopical examination, 383*A*.
basic, oxidising power, 91, *Paper*.
composition, estimation in open-hearth process, 380*A*.
control in steel manufacture, 380*A*.
nitrogen content, 383*A*.
properties, 383*A*.
removal from soaking pits, 388*A*.
SLAG-CEMENT, effect of sulphides, 357*A*.
SLAG INCLUSIONS, steel, 213*P*.
SLAG-METAL EQUILIBRIA, 381*A*.
SLEEPERS :
corrosion in mines, 517*A*.
life in tunnels, 268*D*.
SLURRIES, flocculation, 338*A*.
SOAKING PITS, 388*A*.
slag removal, 388*A*.
SODIUM CARBONATE, treatment of cast iron, 361*A*.
SOLDER, penetration of steel, 432*A*.
SOLIDIFICATION, steel castings, 371*A*.
SOLUTIONS, solid, heterogeneity, 522*A*.
SOLVENTS, action on coal, 334*A*.
SOUTH AFRICAN IRON AND STEEL CORP., coking plant, 340*A*.
SOYA BEAN SOUSE, corrosion of chromium steel, 515*A*.
SPECIFIC HEAT :
cementite, 513*A*.
iron-carbon alloys, 513*A*.
metals, 513*A*.
SPECIFICATIONS :
bars, British, 494*A*.
chains, German, 495*A*.
hooks, British, 494*A*.
rails, British, 494*A*.
steel, French, 495*A*.
steel castings, British, 495*A*.
transformer sheets, British, 495*A*.
SPECTRUM ANALYSIS, 531*A*.
SPHEROIDISATION, steel, 415*A*.
SPONGE IRON, steel produced from, 494*A*.
SPRAYING :
metals, 443*A*, 518*A*.
metals, Schliha process, 444*A*.
metals, Schoop process, 441*A*.
SPRING STEEL :
impact resistance, 165*P*.
manufacture and heat treatment, 129, *Paper*.
surface decarburisation, 129*P*.
surface decarburisation, effect on impact resistance, 165*P*.
SPRINGS :
buffer, stresses, 487*A*.
clock, use of beryllium alloys, 493*A*.
SPRINGS (*contd.*)
elastic behaviour, 458*A*.
heat-treatment furnace, 411*A*.
STÄBLEIN'S METHOD of measuring stresses, 464*A*.
STAINLESS STEEL :
bright annealing, 416*A*.
effect of titanium, 493*A*.
properties, 514*A*.
use in aircraft construction, 493*A*, 514*A*, 515*A*.
welding, 422*A*.
STAINLESS STEEL WIRE, manufacture, 407*A*.
"STATIC" DRY WASHER, 337*A*.
STEAM :
corrosion-cracking of ferro-nickels, 517*A*.
generation, Loeffler system, 330*A*.
STEAM GENERATORS, high-pressure, use in steel plants, 330*A*.
STEEL :
abnormal, transformations, 508*A*.
ageing, 380*A*.
ageing, effect of deoxidation, 468*A*.
ageing, effect of nitrogen and oxygen, 469*A*.
alloy, analysis, 529*A*.
alloy, austenite decomposition, 507*A*.
alloy, defects in hot state, 466*A*.
alloy, properties, 490*A*.
analysis, 528*A*.
annealing, bright, 415*A*.
automobile, machining, 473*A*.
banded structure, 198*P*.
bright-finished, 487*A*.
brittleness, 470*A*, 471*A*.
carburised, hardness, 469*A*.
case-hardening, effect of elements, 412*A*.
cast, properties, 485*A*.
cleaning, Dreibrite process, 435*A*.
coating with cadmium-zinc, 518*A*.
corrosion, 265*D*.
corrosion in citric acid, 522*A*.
corrosion in citric acid, hydrogen diffusion, 527*A*.
corrosion in sulphuric acid, 523*A*.
corrosion - resistant, cold - working, 517*A*.
corrosion - resistant, heat-treatment, 517*A*.
corrosion-resistant, machining, 517*A*.
corrosion-resistant, pickling, 517*A*.
corrosion-resistant, properties, 514*A*.
corrosion-resistant, welding, 517*A*.
creep, 477*A*.
creep, effect of composition and heat-treatment, 474*A*.

STEEL (*contd.*)—
damping capacity, effect of composition and heat-treatment, 481*A*.
decarburisation, catalytic, 412*A*.
deep-drawing, manufacture, 376*A*.
deformation in rolling, 402*A*.
deoxidation, 378*A*.
deoxidation by manganese, 380*A*.
deoxidation by silicon, 380*A*.
dephosphorisation, Perrin process, 379*A*.
desulphurisation, 379*A*.
determination of oxides, iodine method, 249, *Paper*.
effect of beryllium, 493*A*.
effect of carbon, 509*A*.
effect of composition, heat-treatment and degree of forging, 486*A*.
effect of copper, corrosion-resistance, 492*A*.
effect of copper, scaling and red-shortness, 492*A*.
effect of manganese, 492*A*.
effect of manganese, resilience, 491*A*.
effect of molybdenum, 485*A*.
effect of nickel, scaling and red-shortness, 492*A*.
effect of phosphorus, 491*A*.
effect of primary structure, 505*A*.
effect of silicon, 491*A*.
effect of sulphur, 491*A*.
effect of temperature and deformation rate, 485*A*.
effect of titanium, 493*A*.
endurance properties, effect of various factors, 479*A*.
fatigue, effect of composition and heat-treatment, 481*A*.
fatigue at high temperatures, 479*A*.
ferrite formation, effect of deoxidation, 503*A*.
flakes, 384*A*, 385*A*.
free-cutting, 487*A*.
grain size, 380*A*.
grain size, effect of deoxidation, 502*A*.
hardened and tempered, carbides, 504*A*.
hardness, effect of carbon, 472*A*.
heat-resistant, properties, 514*A*.
heat-treatment, 415*A*.
heating, time required, 389*A*.
impact strength at low temperatures, effect of deoxidation, 478*A*.
impact tests, relation to tensile tests, 459*A*.
intercrystalline corrosion, 521*A*.
liquid, carbon-oxygen equilibrium, 381*A*.
liquid, rolling, 403*A*.
STEEL (*contd.*)—
liquid, separation of inclusions, 386*A*.
magnet, casting, 367*A*.
manufacture, 373*A*.
manufacture in high-frequency furnace, 382*A*.
manufacture, slag control, 380*A*.
manufacture from sponge iron, 494*A*.
nickel-clad, manufacture, 445*A*.
nitriding, effect of aluminium and chromium, 413*A*.
nitriding, properties, 490*A*.
notch-sensitiveness under alternating stress, 480*A*.
notch-sensitiveness at high temperatures, 479*A*.
overstraining, 465*A*.
oxides in, 379*A*.
penetration by solder, 432*A*.
pickling, 436*A*.
properties at low-temperatures, 478*A*.
properties and tests, 456*A*.
rail, manufacture, slag control, 380*A*.
rimming, manufacture, slag control, 380*A*.
rimming, properties, 384*A*.
rimming, teeming, 376*A*.
scaled, structure, 181*P*.
scaling, 389*A*, 390*A*, 415*A*.
shear tests, effect of fluid pressure, 462*A*.
specifications, French, 495*A*.
spheroidisation, 415*A*.
structural, alloy, properties, 490*A*.
structural, compression tests at high temperatures, 476*A*.
structural, fatigue, 483*A*.
structural, machinability, 473*A*.
temper-brittleness, 420*A*.
tempering, precipitation processes, 420*A*.
tool, fracture tests, 487*A*.
torsional fatigue, effect of size and shape of test-piece, 481*A*.
wear, effect of carbon, 472*A*.
for weight reduction, 485*A*.
STEEL FOUNDRY PRACTICE, 368*A*.
STEEL PLANT:
replacement of obsolete equipment, 404*A*.
time studies, 404*A*, 405*A*.
Youngstown Sheet and Tube Co., 351*A*.
Yugoslavia, 316*A*.
STEWARTS AND LLOYDS, LTD, coking plant, 346*A*.
STILL COKE OVEN, 343*A*.
STRAIGHTENING, rails and sections, 405*A*.

STRESS :
alternating, notch-sensitiveness of steel, 480*A*.
concentration at holes in plates, 464*A*.
determination by photo-elastic method, 465*A*.
determination by X-ray reflection method, 465*A*.
distribution, influence on commencement of flow, 462*A*.
distribution in notched plates, 467*A*.
distribution in welded parts, 431*A*.
STRESSES :
boiler plates, 466*A*.
buffer springs, 487*A*.
coke-oven walls, 325*A*.
endurance-impact tests, 482*A*.
in impact tests, 461*A*.
quenched cylinders, 419*A*.
self-, for increase of durability, 482*A*.
self-, measurement, Stäblein's method, 464*A*.
self-, in polished rods, 463*A*.
STRESSING :
alternating, tubes under internal pressure, 484*A*.
dynamic, wire rope, 489*A*.
STRIP :
annealing furnaces, 410*A*.
bright normalising, 411*A*.
STRIP MILLS, 400*A*, 401*A*.
American, 400*A*, 401*A*.
conveying machines, 406*A*.
design, 400*A*.
roll deflection, 115*P*, 399*A*.
STRUCTURAL STEEL :
alloy, properties, 490*A*.
compression tests at high temperatures, 476*A*.
fatigue, 483*A*.
machinability, 473*A*.
welding, 428*A*.
STRUCTURE :
alloys, 498*A*.
banded, steel, 198*P*.
ingots, 386*A*.
ingots, effect of mould thickness, 384*A*.
primary, effect on steel, 505*A*.
scaled steel, 181*P*.
SULPHIDES, effect in blast-furnace slag, 357*A*.
SULPHUR :
determination in ferro-alloys, 530*A*.
determination in steel, 530*A*.
effect in iron, notch toughness, 461*A*.
effect in iron, scaling, 181*P*.
effect in steel, 491*A*.
reactions with silicon, 357*A*.
SULPHUR-MANGANESE STEEL, properties, 491*A*.
SULPHUR PRINTS, 502*A*.
reproduction, 297, *Paper*.
SULPHURIC ACID, corrosion of steel, 523*A*.
SUPERHEATING :
cast iron, 451*A*.
cast iron in Schury furnace, 361*A*.
SURFACE DEFECTS, effect on dynamic strength of parts, 463*A*.
SURFACE FINISH, measurement, 434*A*.
SWEDEN, magnesite deposits, 318*A*.

TAR :
coal, properties, 347*A*.
hydrogenisation, 350*A*.
TATA IRON AND STEEL CO., rolling-mill plant, 399*A*.
TEMPER-BRITTLENESS, steel, 420*A*.
TEMPER COLOURS, iron, 420*A*.
TEMPERATURE :
control in reheating furnaces, 390*A*.
effect on mild steel, 485*A*.
fusion, coal ash, 328*A*.
high, compression tests of structural steel, 476*A*.
high, corrosion of metals, 517*A*.
high, fatigue of steel, 479*A*.
high, notch-sensitiveness of steel, 479*A*.
low, impact strength of steel, effect of deoxidation, 478*A*.
low, metallographic work, 499*A*.
low, properties of steel, 478*A*.
regulators, 333*A*, 410*A*.
regulators, photo-electric, 334*A*.
TEMPERED STEEL, carbides, 504*A*.
TEMPERING :
chromium steel, 509*A*.
roller bearings, 420*A*.
steel, precipitation processes, 420*A*.
vanadium steel, 418*A*.
TENSILE TESTING MACHINES, 457*A*.
TENSILE TESTS :
bend-, 459*A*.
cast iron, 447*A*.
metals, 457*A*, 458*A*.
steel, relation to impact tests, 459*A*.
TEST-PIECES, size and shape, effect on torsional fatigue of steel, 481*A*.
TESTING MACHINES, 456*A*.
fatigue, 518*A*.
Griffin-Gale, 457*A*.
hardness, 469*A*, 470*A*.
for small specimens, 457*A*.

TESTING MACHINES (*contd.*)
tensile, 457*A*.
wear, Hanffstengel, 471*A*.
TESTS:
bend, cast iron, 447*A*.
bend, as a guide to ductility, 458*A*.
bend, notched bars, 459*A*.
bend, tensile, 459*A*.
briquette pitch, 339*A*.
cast iron girders, 447*A*.
compression, structural steel at high temperatures, 476*A*.
cupping, bibliography, 394*A*.
cupping, Jovignot, 393*A*.
cupping, National Physical Laboratory, 393*A*.
endurance, boiler tubes, 482*A*.
endurance, cast iron, 482*A*.
endurance, screwed joints, 482*A*.
endurance impact, stresses, 482*A*.
fracture, tool steel, 487*A*.
impact, 460*A*.
impact, allowable stresses, 461*A*.
impact, relation to tensile tests, 459*A*.
impact-bend, cast iron, effect of testing temperature, 448*A*.
magnetic, 496*A*, 499*A*.
magnetic-acoustic, 499*A*.
milling, weld metal, 499*A*.
moulding sand, 364*A*.
non-destructive, 498*A*.
refractory materials, 322*A*.
selection of representative specimens, 456*A*.
shear, metals, effect of fluid pressure, 461*A*.
tensile, cast iron, 447*A*.
tensile, metals, 457*A*, 458*A*.
thermocouples, 409*A*.
THERMAL CONDUCTIVITY, metals, 474*A*.
THERMAL PROPERTIES, metals, 498*A*.
THERMOCOUPLES:
chromel-alumel, standard tables, 409*A*.
testing, 409*A*.
THERMOPERM, magnetic properties, 496*A*.
THERMOTECHNOLOGICAL CALCULATIONS, 328*A*, 332*A*.
THREADS, bolt, strengthening effect, 486*A*.
THYRATRON CONTROL DEVICE, 403*A*.
TILES, steel, enamelling, 444*A*.
TIME-STUDIES, rolling mills and steel plants, 404*A*, 405*A*.
TIN, electrodeposition, 441*A*.
TIN COATINGS:
corrosion-fatigue, 526*A*.
TIN COATINGS (*contd.*)
porosity determination, 442*A*.
weight determination, 442*A*.
TINPLATE:
corrosion, 527*A*.
properties, 442*A*.
rolling, 402*A*.
uniformity of thickness, 402*A*.
uses, 442*A*.
yellow stain, 442*A*.
TINPLATE INDUSTRY, Great Britain, 441*A*.
TITANIUM:
determination in steel, 529*A*.
effect in steel, 493*A*.
effect in steel, case-hardening, 412*A*.
use in steel making, 378*A*.
TITANIUM OXIDE, effect in enamels, 444*A*.
TOOL STEEL:
composition and use, 435*A*.
fracture tests, 487*A*.
hardening, 417*A*.
manufacture, 373*A*.
properties, 490*A*.
TORSIONAL FATIGUE, steel, effect of size and shape of test-piece, 481*A*.
"TRADE HEAT" METHOD of steel making, 376*A*.
TRANSFORMATIONS:
abnormal steel, 508*A*.
alloys, 498*A*.
chromium steel, 509*A*.
iron, 508*A*.
iron-aluminium alloys, 225, *Paper*.
iron-chromium alloys, 511*A*.
second order, 509*A*.
TRANSFORMER SHEETS, specification, British, 495*A*.
TRANSPORT, compressed gases, 349*A*.
TRANSUE AND WILLIAMS, CO., forge furnaces, 388*A*.
TRICHLORETHYLENE, for cleaning metals, 518*A*.
TROOSTITE, nodular, formation, 506*A*.
TSCHULENK TUBE PROCESS, 404*A*.
TUBES:
alternating stressing under internal pressure, 484*A*.
boiler, endurance tests, 482*A*.
corrosion, 525*A*.
drawing, flow of material, 404*A*.
weldless, manufacture, Tschulenk process, 404*A*.
TUCK-AMEL, 518*A*.
TUNGSTEN:
effect in steel, case-hardening, 412*A*.
effect in steel, creep strength, 475*A*.

TUNGSTEN MAGNET STEEL, effect of annealing, 497*A*.
TUNGSTEN STEEL, properties, 490*A*.
TURBINE WHEELS, manufacture, 368*A*.
TURBO-BLOWERS, use for producers, 347*A*.
TYRES, failure, 488*A*.

UDYLITE PROCESS, 518*A*.
UNITED KINGDOM:
  blast-furnace practice, 353*A*.
  coal deposits, 316*A*.
  specification for bars, 494*A*.
  specification for hooks, 494*A*.
  specification for rails, 494*A*.
  specification for steel castings, 495*A*.
  specification for transformer sheets, 495*A*.
  tinplate industry, 441*A*.
UNITED STATES:
  blast-furnace design, 351*A*.
  coal deposits, 317*A*.
  iron industry, 351*A*.
  iron ore deposits, 317*A*.
  sheet and strip mills, 400*A*, 401*A*.
  tool steel manufacture, 373*A*.
UPPER SILESIAN COAL, coking properties, 342*A*.

VALUATION, iron ore, 320*A*.
VALVE SPRINGS, heat-treatment furnaces, 411*A*.
VALVE STEEL, properties, 515*A*.
VANADIUM:
  effect in steel, case-hardening, 412*A*.
  effect in steel, creep strength, 475*A*.
VANADIUM STEEL:
  carbides, 512*A*.
  heat-treatment, 418*A*.
  properties, 490*A*.
VAPOUR-PRESSURE/TEMPERATURE RELATIONSHIP, metals, 513*A*.
VAUXHALL MOTORS, LTD., sheet metal department, 394*A*.
VISCOSITY, wire, 462*A*.

WALES, coal deposits, 316*A*.
WÄRMESTELLE, control section, 333*A*.
WASHING TUBS, enamelling, 444*A*.
WASTE GAS:
  analysis, 533*A*.
  moisture content, determination, 329*A*.
WASTE HEAT, utilisation, 330*A*, 331*A*.
WATER, determination in gas, 534*A*.
WATER MAINS, failure, 525*A*.
WEAR:
  initial, machine parts, 471*A*.
  iron alloys, 472*A*.
  oxidation, metals, 471*A*.
  rails, 472*A*.
  steel, effect of carbon, 472*A*.
WEAR RESISTANT STEEL, 472*A*.
WEAR TESTING MACHINE, Hanffstengel, 471*A*.
WEARMOUTH COLLIERY, coal-cleaning plant, 337*A*.
WELD DECAY, prevention, 429*A*.
WELD METAL:
  arc, properties, 430*A*.
  effect of hydrogen, 425*A*.
  effect of nitrogen, 426*A*, 427*A*.
  micro-mechanical study, 428*A*.
  milling test, 499*A*.
  properties, 427*A*.
  reactions, 426*A*.
WELDED PARTS:
  design, 426*A*.
  fatigue, 430*A*.
  fusion-, properties, 429*A*.
  stress distribution, 431*A*.
  X-ray examination, 431*A*, 432*A*.
WELDED PLATES, corrosion, 516*A*.
WELDING:
  aircraft materials, 422*A*.
  arc, 423*A*.
  arc, pressure vessels, 423*A*.
  autogenous, 422*A*.
  cast iron, 424*A*.
  chromium-nickel steel, 424*A*, 425*A*.
  chromium steel, 424*A*, 425*A*.
  copper alloys, 422*A*.
  corrosion-resistant steel, 517*A*.
  electric resistance, 424*A*.
  fusion, pressure vessels, 424*A*.
  heat-resistant steel, 425*A*.
  nickel-chromium steel, 425*A*.
  oxy-acetylene, 422*A*.
  pipes, 422*A*.
  spot, projection method, 425*A*.
  stainless steel, 422*A*.
  structural steel, 428*A*.
  thermit, 422*A*.
WELDING ELECTRODES, composition, 426*A*.
WELDING GENERATORS, 423*A*.
WELDING MACHINES:
  resistance, 424*A*.
  spot, 425*A*.
WELDING RODS, 423*A*.
  coatings, 424*A*.
WELDING SYMPOSIUM, proceedings, 55, 421*A*.
WELDS, spot, properties, 427*A*.

WELLMAN-SOWARD PORTS, 376A.
WHEELABRATOR, 362A.
WHEELS:
  car, forging, 392A.
  chilled, manufacture, 366A.
WHESSOE ELECTRO-DEDUSTING PLANT, 348A.
WHITEHEAD IRON AND STEEL CO., LTD., rolling-mill plant, 398A.
WIEDBACHTAL, iron ore deposits, 316A.
WIRE:
  annealing furnaces, 410A.
  chromium-vanadium steel, 407A.
  coil conveyors, 407A.
  cold-drawn, ageing, 477A.
  corrosion tests, 516A.
  electrogalvanising, 441A.
  shape, drawing, 407A.
  stainless steel, manufacture, 407A.
  steel, ageing, 516A.
  steel, alternating bend strength, 483A.
  steel, effect of deformation rate, 485A.
  steel, fatigue, 482A.
  steel, fatigue, effect of lubricants, 483A.
WIRE-DRAWING:
  deformation of material, 408A.
  history, 406A.
  lubrication, 397A.
WIRE-DRAWING DIES, use of carbides, 407A.
WIRE-DRAWING MACHINE, combined with cold-heading, 406A.
WIRE ROPE:
  dynamic stressing, 489A.
  properties, 489A.
  X-ray examination, 489A.
WITTON INDUCTION FURNACE, 381A.
WOOD, zinc-chloride-treated, corrosion of metals, 526A.
WROUGHT IRON:
  Civil War period, properties, 493A.
  corrosion, 523A.
  nickel, properties, 494A.
W.W.D. ELECTRO-DETARRER, 348A.
WYNDHAM LIQUID-COAL PROCESS, 350A.

X-RAY EXAMINATION:
  castings, 501A.
  metals, 499A.
  welded parts, 431A, 432A.
  wire rope, 489A.
X-RAY FLUORESCENT SCREENS, 500A.
X-RAY REFLECTION METHOD:
  focusing chamber, 501A.
  for stress determination, 465A.
X-RAYS, long-range exposures, 500A.

YORKSHIRE COKING AND CHEMICAL CO., coking plant, 340A.
YOUNGSTOWN SHEET AND TUBE CO.:
  plant, 351A.
  strip mills, 400A.
  wire manufacture, 407A.
YUGOSLAVIA:
  mineral deposits, 316A.
  steel plant, 316A.

ZINC, electrodeposition, 438A, 441A.
ZINC-BEARING IRON ORE, recovery of zinc, 357A.
ZINC-CHLORIDE-TREATED WOOD, corrosion of metals, 526A.
ZINC COATINGS, corrosion-fatigue, 526A.
ZIRCONIUM:
  determination in iron and steel, 530A.
  determination in ores, 532A.
  uses, 319A.
ZIRCONIUM ORE DEPOSITS:
  Brazil, 319A.
  France, 319A.
  Madagascar, 319A.
  Senegal, 319A.

NAME INDEX.

ABBOTT, E. J., measurement of surface finish, 434*A*.
ABWESER, C., corrosion of tubes, 525*A*.
ADRIAN, W., welding, 421*A*.
AHLEN, A. VAN:
  coking index of coal, 341*A*.
  fusain characteristics of coals, 335*A*.
ALBERTS, W., Brackelsberg furnace, 381*A*.
ALEXANDER, M., awarded Carnegie Research Grant, 33.
ALLISON, A., deflection of rolls, 121*D*.
ANDERSON, M. J., conveyors for strip mills, 406*A*.
ANDREAE, F. V., electric furnaces, 381*A*.
ANDREW, J. H.:
  alloy steels, 490*A*.
  scaling of steel, 202*D*.
ANDREW, J. H. and RICHARDSON, G. T.: *Paper*, "An Investigation of Spring Steels," 129. *Discussion*, 150. *Correspondence*, 158. *Authors' Reply*, 162.
APPLEYARD, K. C., carbonisation of small coal, 346*A*.
ARBATSKY, J. W., waste-gas analysis, 533*A*.
ARCHIBALD, R. S., Marquette Iron District, 317*A*.
ARNOLD, F. W., jun., determination of zirconium, 532*A*.
ARPI, R., fracture test of tool steel, 487*A*.
ASADA, C., elected member, 1.
ASBURY, R. S., action of solvents on coal, 334*A*.
ASH, E. J., effect of casting conditions on cast iron, 451*A*.
ASKEW, W. G., galvanising, 441*A*.
AURIBAULT, C., pickling of rustless steel, 517*A*.
AUSTIN, C. R.:
  controlled atmospheres in heat treatment, 416*A*.
  elected member, 1.
AUSTIN, J. B.:
  iron-chromium alloys, 511*A*.
  thermal conductivity of refractories, 324*A*.
  transformation of austenite, 507*A*.
AUVIL, S., coking practice, 343*A*.
BADLAM, S., American sheet-mill practice, 401*A*.
BAECHLER, R. H., corrosion of metal in zinc-chloride-treated wood, 526*A*.
BAGAI, M. M., high-frequency furnaces, 382*A*.
BAILEY, F. J., blast-furnace heat loss, 85*D*.
BALES, C. E., cupola refractories, 326*A*.
BALLARD, W. E., metal spraying, 443*A*.
BALLAY, M., corrosion of cast iron, 517*A*.
BAMFORD, W. H., cupola practice, 360*A*.
BANFIELD, T. A., elected associate, 3.
BANNISTER, C. O., by-products from blast-furnace, 357*A*.
BANNISTER, L. C., corrosion, 269*D*.
BARBER, A. T., hydrogenation plant, 350*A*.
BARDENHEUER, P.:
  effect of slag on cast iron, 450*A*.
  reactions in acid open-hearth process, 377*A*.
BARKER, G. H.:
  automatic gas control, 333*A*.
  heat-treatment furnaces, 410*A*.
BARNHART, A. C., grindability of coal, 338*A*.
BARRETT, E. P., sponge iron, 494*A*.
BARY, J., chemical protection of metals, 517*A*.
BATEMAN, W. H., propane and butane, 350*A*.
BATTA, G., refractory materials, 322*A*.
BATTY, G.:
  porosity in steel castings, 372*A*.
  solidification of castings, 371*A*.
BAUERSFELD, W., torsional fatigue strength of steel, 481*A*.
BAUKLOH, W., decarburisation of cast iron by hydrogen, 449*A*.
BAVISTER, H. S., elected member, 1.
BECKER, E., brazing of castings, 432*A*.
BECKER, M. L., spring steels, 150*D*.
BEENY, H., carbide-cutting tools, 435*A*.
BEEUWKES, R., jun., stress concentration produced by holes, 464*A*.
BEINTMANN, P., effect of temperature and deformation rate on steel, 485*A*.
BELAIEW, N. T., lamellar pearlite, 505*A*.
BELGIANS, KING OF THE, elected Hon. Member, 7.

BELL, A. G., coal sampling, 532*A*.
BELL, J. W., steel manufacture, 373*A*.
BENGOUGH, G. D.:
corrosion tests, 285*D*, 516*A*.
probability of corrosion, 273*D*.
BENLOZ, P., heat treatment of rustless steel, 517*A*.
BENNEK, H.:
effect of copper and nickel in steel, 492*A*.
flakes in steel, 385*A*.
hardening and tempering phenomena in chromium steel, 509*A*.
heat treatment of vanadium steel, 418*A*.
BENNETT, J. S., moulding sands, 366*A*.
BENOIST, G., storage of compressed gases, 349*A*.
BERNHARDT, E. O., metallographic films, 500*A*.
BERTHELOT, C., De Vooys coal-cleaning process, 337*A*.
BERTHOLD, R.:
tests of materials, 498*A*.
X-ray exposures, 500*A*.
X-ray fluorescent screens, 500*A*.
BEYNON, C. E., yellow stain on tin-plates, 442*A*.
BIGGS, H. C., foundry refractories, 326*A*.
BISCHOF, W.:
carbides in vanadium steel, 512*A*.
temper-brittleness, 420*A*.
BLACKWOOD, R. R., properties of weld metals, 430*A*.
BLAKELEY, T. H., reactivity of coke, 347*A*.
BLAKISTON, J., ingot moulds and ladles, 367*A*.
BLECKMANN, H., rolling of molten steel, 403*A*.
BLOOM, E., jun., electrodeposition of zinc, 441*A*.
BLUM, W.:
corrosion of nickel and chromium coatings, 526*A*.
electrodeposition of nickel, 439*A*.
BOEL, L., elected member, 1.
BOHM, I., hardening of bearing races, 418*A*.
BOISSAUX, T., heat treatment of cast iron, 421*A*.
BONDY, O., fatigue of welded joints, 430*A*.
BOOL, E. D., elected member, 1.
BOOTH, G., awarded Carnegie Research Grant, 33.
BORNHOFEN, O., coefficient of expansion of cast iron, 449*A*.
BORREIS, B. VON, electron microscope, 499*A*.
BOSTON, O. W., tests on cutting fluids, 436*A*.
BOULANGER, C., chemical coatings, 517*A*.
BOVET, L., corrosion-resistant cast iron, 454*A*.
BOWLAND, A., hot-blast stoves, 352*A*.
BOWLAND, D. W., X-ray examination of castings, 501*A*.
BOYDEN, C., metal spraying, 443*A*.
BOYNTON, A. J., control of furnaces, 333*A*.
BOZORTH, R. M., heat treatment of magnetic materials, 417*A*.
BRADLEY, R. S., thermal conductivity of refractories, 324*A*.
BREMER, E., meehanite castings, 367*A*.
BRENNER, A., corrosion of nickel and chromium coatings, 526*A*.
BRIGGS, C. W.:
contraction of cast steel, 371*A*.
cracking of castings during pickling, 438*A*.
BRING, G. G., classifiers in ore dressing, 320*A*.
BROBECK, F., core tolerances, 363*A*.
BROCKE, F., superheating of cast iron, 361*A*.
BROWN, A. W., shrinking metal parts, 434*A*.
BROWN, G. W., mechanised foundries, 370*A*.
BROWN, M. A. W., corrosion of ships, 271*D*.
BROWNE, L. E., soaking pits, 388*A*.
BRUCE, W. T., foundry practice in India, 367*A*.
BRÜCHE, E., transformations in iron, 508*A*.
BRUHAT, G., heat transmission by radiation, 329*A*.
BRYAN, J. M., corrosion of iron, 522*A*.
BÜHLER, H.:
effect of die shape on stresses in steel, 394*A*.
self-stresses in rods, 463*A*.
stresses in quenched steel, 419*A*.
stresses in welds, 430*A*.
BULL, H., stainless steel, 514*A*.
BULL, R. A., porosity in steel castings, 372*A*.
BUMM, H., effect of silicon on stability of martensite, 506*A*.

BUNGEROTH, A., flakes in chromium-nickel steel, 385*A*.
BUNKER, H. L., jun., ash-fusion temperature of coal mixtures, 328*A*.
BURCHARTZ, H., sulphides in blast-furnace slag, 357*A*.
BURNHAM, T. H., metallurgical progress, 484*A*.
BURNS, R. H., plastic deformation of perforated plates, 463*A*.
BURTON, H. H., elected member, 1.
BUSCHMANN, E., bending-tensile test, 459*A*.

CALOW, T. A., elected member, 1.
CARPENTER, SIR HAROLD :
induction as President, 27.
Presidential Address, 35.
speech at dinner, 308.
CARRASCO, O., corrosion of tinplate, 527*A*.
CASWELL, J. S. :
Paper, "The Deflection of the Rolls in Plate, Sheet and Strip Mills," 115. *Correspondence*, 125. *Author's Reply*, 127.
deformation of steel in rolling, 402*A*.
rolling of blackplates, 402*A*.
rolling of flat stock, 399*A*.
variation of substance in tinplates, 402*A*.
CAZAUD, R., corrosion tests, 517*A*.
CHABOT, L. S., jun., Marquette Iron District, 317*A*.
CHANDLER, G. C., determination of zirconium, 532*A*.
CHAO, WEN-MIN, durains and cannel coals, 335*A*.
CHARRIN, V., zirconium, 319*A*.
CHAUDRON, G., corrosion, 517*A*.
CHAUSSAIN, M., corrosion tests, 520*A*.
CHESTERS, J. H., burning of magnesite bricks, 322*A*-, 323*A*.
CHEVENARD, P. :
corrosion-cracking of ferro-nickels, 517*A*.
heterogeneity of solid solutions, 522*A*.
photographically recording micro-machines, 457*A*.
tests on welds, 428*A*.
viscous deformation of wires, 462*A*.
CHI, Y. S., coal in China, 318*A*.
CHIPMAN, J., solubility of nitrogen in iron, 467*A*.
CHRISTOPHER, C. F., iron oxide control in basic process, 380*A*.
CIFER, chemical protection of metals, 518*A*.
CLAMER, G. H., induction furnaces, 381*A*.
CLARK, C. L., properties of steel at high temperatures, 477*A*.
CLARK, G. L., burning of magnesite bricks, 323*A*.
CLARK, P. H., creep test furnace, 474*A*.
CLARKE, S. G., porosity of tin coatings, 442*A*.
CLAYTON, D., roughness measurement, 473*A*.
CLEWS, F. H., gas permeability of refractories, 324*A*.
CLYNE, R. W., fatigue of metals, 479*A*.
COBB, J. W., reactivity of coke, 347*A*.
COKER, E. G. :
cracking of steel, 467*A*.
deflection of rolls, 125*D*.
COLBECK, E. W., estimation of non-metallic matter in steel, 256*D*.
COLES, G., coal analysis, 533*A*.
COLONY, R. J., magnetite in Puerto Rico, 317*A*.
COMSTOCK, G. F., effect of titanium in steel, 493*A*.
CONE, E. F. :
cobalt magnet steel, 498*A*.
nickel wrought iron, 494*A*.
wear-resistant steel, 472*A*.
CONNARROE, A. N., properties of cast steel, 485*A*.
COOK, G., effect of pressure on flow of metals, 461*A*.
CORNELIUS, H. :
ageing of steel, 469*A*.
transformations in abnormal steel, 508*A*.
COTEL, F., wear of rails, 472*A*.
COURNOT, J. :
corrosion tests, 520*A*.
protective coatings, 517*A*.
COUSE, A., elected member, 1.
COX, H. L., design of crane hooks, 489*A*.
CRADDOCK, E., open-hearth refractories, 326*A*.
CRADDOCK, E. B., use of town gas, 349*A*.
CRAMER, H., roll collars, 395*A*, 396*A*.
CRITCHETT, J. H., welding rods, 423*A*.
CROSS, H. C. :
creep of chromium-molybdenum steel, 476*A*.
creep and fatigue of nickel-chromium steel, 476*A*.
CROW, T. B., elected member, 1.
CRYDER, D. S., gas analysis, 533*A*.

DAHL, A. J., standard tables for thermocouples, 409*A*.
DAHL, O., magnetic properties of iron-nickel alloys, 498*A*.
DAHL, T., measuring apparatus in rolling process, 395*A*.
DALSIMER, P. D., corrosion, 523*A*.
DAMIEN, M., cleaning of metals, 518*A*.
DAMOUR, flame studies, 329*A*.
DANILOFF, B. N., effect of deoxidation on ageing, 468*A*.
DARLING, A. G., steam generators, 330*A*.
DAVID, E. V., shrinking metal parts, 434*A*.
DAVIDENKOFF, N. N., impact strength of metals, 461*A*.
DAVIDSON, C. F., resistance welding, 424*A*.
DAVIES, C. E.:
  cold-rolling mills, 400*A*.
  deflection of rolls, 125*D*.
DAVIES, D. T., flocculation of slurries, 338*A*.
DAVIES, W. B., coal cleaning, 337*A*.
DAVIES, W. H., elected associate, 3.
DAVIS, A. F., welding of cast iron, 424*A*.
DAVIS, C. W., magnetic separation of ores, 321*A*.
DAVIS, J. D.:
  coking practice, 343*A*.
  coking properties of coal, 342*A*.
DAVIS, R. W., strip mill of Inland Steel Co., 401*A*.
DAVISON, G. H., elected member, 2.
DAVY, C. H., elected member, 2.
DAWE, A., coal analysis, 533*A*.
DAWSON, S. E., rotary furnaces, 361*A*.
DAYTON, R. W., polarisation microscope, 499*A*.
DEAN, R. S., sponge iron, 494*A*.
DEARDEN, W. H.:
  Note, "Reproducible Sulphur Prints," 297.
DE BELIN, G. A., structure of scaled steel, 206*D*.
DE FOREST, A. V., surface defects in machine parts, 463*A*.
DEHLINGER, U.:
  effect of silicon on stability of martensite, 506*A*.
  transformations in iron, 509*A*.
DEISS, E., sulphides in blast-furnace slag, 357*A*.
DELADRIÈRE, M., determination of moisture in waste gas, 329*A*.
DELBART, G. R., elected member, 2.
DENNIS, C. C., elected member, 2.
DÉRIBÉRÉ, M., chromium, 318*A*.
DESCH, C. H.:
  cold pressing, 393*A*.
  iodine method of estimating oxides in steel, 255*D*.
  structure of scaled steel, 201*D*.
  tests of materials, 456*A*.
DIEPSCHLAG, E.:
  effect of slag on cast iron, 449*A*.
  reduction of manganese oxide, 356*A*.
DIERKER, H. A., scrap in cupolas, 361*A*.
DIETERT, H. W., moulding sands, 365*A*.
DIETZEL, A., enamels, 445*A*.
DINGLE, H., spectroscopy, 531*A*.
DITTMAR, H., malleable cast iron, 369*A*.
DIXON, E. S.:
  ageing embrittlement of chromium steel, 469*A*.
  chromium steel tubes for refinery stills, 516*A*.
  wrought iron, 493*A*.
DLOUGATCH, L., dendrites in metals, 503*A*.
DOBNER, A. E., Monell process, 376*A*.
DOBROWIDOW, A. N., nitriding of cast iron, 413*A*.
DOCHERTY, J. G., bend tests on notched bars, 459*A*.
DOLCH, P. reactions of silicon with sulphur, 357*A*.
DONALDSON, J. W., silicon alloys, 491*A*.
DREES, K., coking properties of coal, 342*A*.
DRINNAN, R. G., elected member, 2.
DUMA, J. A., spheroidisation of steel, 415*A*.
DUMMELOW, J.:
  bright annealing, 415*A*.
  nitriding of cylinder liners, 414*A*.
  Witton induction furnace, 381*A*.
DUMMETT, G. A., coking properties of coal, 342*A*.
DUNKAK, E. B., immersion heating with gaseous fuel, 331*A*.
DUQUENOY, M., semi-rustless steel, 518*A*.
DUSSOURD, E. J. L., properties of spot welds, 427*A*.
DWIGHT, H. B., high-frequency furnaces, 382*A*.
DWYER, P.:
  core-making, 363*A*.
  cupola practice, 360*A*.
  foundry of Chevrolet Co., 370*A*.
  gates and risers, 363*A*.

EASTER, G. J., oxidation of refractory materials, 323*A*.

EASTHAM, J. N, moulding machines, 363*A*.
EDDY, W. P., jun., properties of cylinder liners, 448*A*.
EDWARDS, C. A., structure of scaled steel, 205*D*.
EILENDER, W.:
ageing of steel, 469*A*.
decarburisation of steel, 390*A*.
flakes in chromium-nickel steel, 385*A*.
nitrogen in slags, 383*A*.
ELL, O., insulation of steel furnaces, 327*A*.
ELLIS, W. C., magnetic materials, 495*A*.
ENGEL, F., rolling of beams 399*A*.
ENLUND, E. D., structure of ingots, 386*A*.
EPSTEIN, S.:
carburising of copper steel, 412*A*.
physical chemistry of steel making, 380*A*.
ERDMANN, C. E., coal in Colorado, 317*A*.
ERIKSSON, S., iron-chromium-nitrogen system, 512*A*.
ESSER, H., flakes in chromium-nickel steel, 385*A*.
ESTEP, T. G., ash-fusion temperature of coal mixtures, 328*A*.
EUGÈNE, hardness testing machine, 469*A*.
EULER, H.:
electricity in German ironworks, 331*A*.
time studies, 405*A*.
EVANS, B. J. R., electrodeposition, 438*A*.
EVANS, E. C., British iron and steel making practice, 353*A*.
EVANS, H.:
Paper, "Transformations in Iron-Aluminium Alloys." *See* Sykes, C.
EVANS, U. R.:
corrosion tests, 274*D*.
effect of mill scale on paint performance, 516*A*.
temper colours, 420*A*.
EVEREST, A. B.:
magnet steel, 367*A*, 497*A*.
EVERETT, F. L., fatigue failure of machine parts, 479*A*.
EWIJK, L. J. C. VAN, penetration of solder in steel, 432*A*.
EYERMANN, P., duplex process, 376*A*.
FALK, A. E., centrifugally cast piston cores, 368*A*.
FARNHAM, R. V., drying of coal, 343*A*.
FEIL, E., loam cores, 364*A*.
FERGUSON, J. M., basic slags, 383*A*.
FEYDEAU, L. DE, manipulators for rolling mills, 405*A*.
FIELD, S., electrodeposition, 438*A*, 439*A*.
FIELDNER, A. C., coking properties of coal, 342*A*.
FINCK, J. L., thermal conductivity of refractories, 324*A*.
FINK, C. G., electrodeposition of cadmium-zinc alloys, 440*A*.
FINK, W., oxidation wear of metals, 471*A*.
FISCHER, V., manganese-copper-iron-nickel diagram, 509*A*.
FISHER, A., Knowles carbonisation process, 345*A*.
FISHER, A. J., control of furnaces, 333*A*.
FISKE, R. A., chilled wheels, 366*A*.
FLADER, F., stainless steel in aircraft construction, 515*A*.
FLOWER, A. H., adhesion of rubber to metal, 446*A*.
FLÜGGE, A.:
conveyors for handling wire, 407*A*.
straightening of rails, 405*A*.
FORBES, D. P., malleable cast iron, 455*A*.
FORD, L. H., magnetic testing, 495*A*.
FÖRSTER, J., temperature regulators, 410*A*.
FOSTER, C. E., pyrometers, 409*A*.
FOX, G., blooming mill drives, 403*A*.
FOX-ALLIN, P., coal cleaning, 337*A*.
FOXWELL, G. E.:
coke-oven refractories, 324*A*.
Goldschmidt flue in coke-ovens, 344*A*.
FRAAS, F., gas analysis, 534*A*.
FRANCIS, J. L., sound castings, 370*A*.
FRANCIS-CARTER, C. F. J., electrodeposition, 438*A*.
FRANÇOIS, S., metallisation, 518*A*.
FRATI, N., high-frequency furnaces, 382*A*.
FREE, G., decomposition of Ruhr coal, 335*A*.
FREEMAN, H., iron oxide control in basic process, 380*A*.
FREEMAN, S. E., gases in enamels, 445*A*.
FRERICH, R., basic Bessemer practice, 374*A*.
FREUND, H.:
illumination in metallography, 500*A*.
microscopes, 500*A*.

FRIEDMANN, W., alternating bend strength of wire, 483*A*.
FROST, A. E.:
spring steels, effect of surface condition, 155*D*.
spring steels, resistance to repeated impact, 176*D*.
FRY, A., alloy steels, 490*A*.
FUCKE, H.:
determination of alumina, 528*A*.
determination of oxides, 528*A*.
FUJIWARA, T., segregation in nickel-steel ingots, 384*A*.
FUKUSIMA, M., inclusions in steel, 386*A*.
FUTERS, T. C., "Static" dry washer, 337*A*.

GABER, E., tensile testing machine, 457*A*.
GALIBOURG, J., properties of metals subjected to corrosion, 517*A*.
GALLO, P. M., electric drives, 404*A*.
GANDHI, I. N., elected member, 2.
GATWARD, W. A., alloys for thermo-couples, 410*A*.
GEBHARD, K.:
hardening of tool steel, 417*A*.
high-speed steel manufacture, 382*A*.
GEISLER, W. A., elected member, 2.
GELLER, W., iron-cobalt-titanium system, 512*A*.
GENUNG, W. E., rubber-lined pickling plant, 436*A*.
GEORGE, E. J.:
speech at dinner, 312.
work of Corrosion Committee, 267*D*.
GERLACH, W.:
magnetic testing, 496*A*.
spectrum analysis, 531*A*.
GEROLD, E., measurement of self-stresses, 464*A*.
GEZELIUS, R. A.:
contraction of cast steel, 371*A*.
cracking of castings during pickling, 438*A*.
GILL, E. T., awarded Carnegie Research Grant, 33.
GILL, J. P., tool steel manufacture, 373*A*.
GIRON, J., coal tar, 347*A*.
GIRY, L., machining of rustless steel, 517*A*.
GLINN, R. J., steam generation, 330*A*.
GLOAG, V. F., coal cleaning, 336*A*.
GLOCKER, R., X-ray examination of wire ropes, 489*A*.

GOECKE, E., briquette pitch, 339*A*.
GOFF, I. N., open-hearth slag composition, 380*A*.
GOLDSCHMIDT, F., roof flues in coke-ovens, 344*A*.
GOODACRE, R.:
fatigue of steel wire, 483*A*.
Awarded Carnegie Research Grant, 33.
GOSSELIN, A., elected member, 2.
GOTTFELDT, H., welded plate girders, 424*A*.
GOUGH, H. J.:
cold pressing, 393*A*.
design of crane hooks, 489*A*.
tests on cast-iron girders, 447*A*.
tests of materials, 456*A*.
GOWENS, G. J., standard tables for thermocouples, 409*A*.
GRAF, O., fatigue of welds, 430*A*.
GRAHAM, A. K., electrodeposition of zinc, 441*A*.
GRAHAM, R.:
Paper, "An Investigation into the Oxidising Power of Basic Slags." *See* White, J.
GRANJON, R., autogenous welding, 422*A*.
GRANT, L., elected member, 2.
GRANT, L. E., locomotive tyres, 488*A*.
GRARD, corrosion, 517*A*.
GRAY, J. T., enamelling plant, 444*A*.
GREAVES, R. H., impact tests, 460*A*.
GREEN, A. T., gas permeability of refractories, 324*A*.
GREGORY, E., deoxidation of steel, 378*A*.
GREGORY, E. W., elected member, 2.
GRENINGER, A. B., orientation of crystals, 501*A*.
GREY-DAVIES, T. G., steel for deep-drawing, 376*A*.
GRIFFITHS, L. J., elected member, 2.
GRIFFITHS, T. A., elected member, 2.
GRIFOLL, I.:
Note, "Electro-Chemical Interpretation of Cleaning." *See* Jimeno, E.
GROCHOLL, K., risers and feeder heads, 363*A*.
GROSS, H., precipitation and martensitic hardening, 467*A*.
GRÜN, P., creep of steels, 474*A*.
GRUNER, E., temperature regulators, 410*A*.
GRUNERT, A., chromium-aluminium-iron alloys, 515*A*.
GUÉDRAS, M., desulphurisation of steel, 379*A*.

GUILLERY, R.:
hardness testing machine, 470*A*.
testing machines, 456*A*, 457*A*.
GUILLET, L., jun., elasticity modulus of metals, 458*A*.
GUMMERT, H., properties of forgings, 485*A*.
GUTHMANN, H., decarburisation of cast iron by hydrogen, 449*A*.
GUY, T. W., coal sampling, 532*A*.

HAAS, A., tests of metals, 456*A*.
HACKING, R. A., blast-furnace heat loss, 84*D*.
HAIGH, B. P.:
cracking of steel, 467*A*.
fatigue of structural steel, 483*A*.
HALCROW, W., transport of ore, 320*A*.
HALFMANN, K., plated sheets, 445*A*.
HALL, G., high-duty cast iron, 361*A*.
HALL, W., pickling of steel, 436*A*.
HALLAM, H., impact tests, 460*A*.
HAMMOND, R. A. F., electrodeposition of nickel, 439*A*.
HAND, R. F., corrosion of oil tankers, 524*A*.
HAND, T. W., rolling-mill practice, 398*A*.
HANDFORTH, J. R., aircraft steels, 488*A*.
HANKINS, G. A., cold pressing, 393*A*.
HANKINS, G. A. and MILLS, H. R.:
Paper, "The Resistance of Spring Steels to Repeated Impact Stresses," 165. *Correspondence*, 176. *Authors' Reply*, 178.
HANOT, C., coal flotation, 337*A*.
HARLEY, A. N., foundry planning, 370*A*.
HARRIS, H., elected member, 2.
HARRISON, W. N., properties of enamels, 444*A*.
HARRY, R. J., cranes, 383*A*.
HARTIG, H., Russian iron industry, 359*A*.
HARVEY, F. A., open-hearth refractories, 326*A*.
HASSON, J. O., protective paints, 446*A*.
HATFIELD, W. H.:
alloy steels, 490*A*.
corrosion, 282*D*.
corrosion of ships, 524*A*.
determination of oxides, 261*D*.
intercrystalline corrosion, 521*A*.
stainless steel for aircraft construction, 514*A*.
structure of scaled steel, 200*D*.
work of Corrosion Committee, 265*D*.
HAY, R.:
Paper, "An Investigation into the Oxidising Power of Basic Slags." *See* White, J.
HEGER, A., open-hearth refractories, 325*A*.
HEIKEN, C., cast-steel rotor, 368*A*.
HEILIGENSTAEDT, W., thermotechnological calculations, 332*A*.
HEILMAN, R. H., thermal conductivity of refractories, 324*A*.
HEISSERMAN, R. J., transport in foundries, 370*A*.
HEMPEL, M., fatigue and damping capacity of steel, 481*A*.
HENRICOT, J., elected member, 2.
HEPBURN, W. M.:
controlled atmospheres in heat treatment, 416*A*.
insulating materials, 326*A*.
HERBST, H., stresses in cables, 489*A*.
HERSCHMANN, A. J., Tschulenk tube-making process, 404*A*.
HERTY, C. H., jun.:
effect of deoxidation on ageing, 468*A*.
effect of deoxidation on ferrite formation, 503*A*.
effect of deoxidation on grain size, 502*A*.
effect of deoxidation on impact strength, 478*A*.
iron oxide control in basic process, 380*A*.
HERZOG, E., copper steels, 517*A*.
HESSENBRUCH, W., chromium-aluminium-iron alloys, 515*A*.
HEYDEN, T., Bessemer converters, 373*A*.
HEYER, R. H., plastic deformation of perforated plates, 463*A*.
HIGHDUCHECK, J. M., malleable cast iron, 369*A*.
HIGHFIELD, W. E., protective paints, 446*A*.
HILL, K., sandblasting, 434*A*.
HILPERT, A., welding, 421*A*.
HIRD, J., copper in cast iron, 455*A*.
HIRONE, T., ferromagnetism, 496*A*.
HITCHINS, C. F., elected member, 2.
HOAR, T. P., corrosion tests, 278*D*.
HOARE, W. E., tinplate, 442*A*.
HODGE, J. C., arc welding of chromium steel, 424*A*.
HODGSON, C. C., spring steels, 158*D*.
HOFF, H., measuring apparatus in rolling process, 395*A*.
HOFFMANN, E., phosphorus content of coal and coke, 335*A*.

HOFFMANN, U., oxidation wear of metals, 471*A*.
HOLLAND, E., elected associate, 3.
HOLLINDERBÄUMER, W., foundry coke, 347*A*.
HOLMES, C. W. H., clarification of washery water, 338*A*.
HOLMES, P., time studies, 404*A*.
HOLMQUIST, P. J., carbon deposition in blast-furnaces, 325*A*.
HOLTHAUS, C.:
corrosion of sheet piling, 523*A*.
determination of sulphur, 530*A*.
HONDA, K., specific heat of alloys, 513*A*.
HOOK, W., awarded Carnegie Research Grant, 33.
HORNBY, F. B., welding generators, 423*A*.
HOTHERSALL, A. W.:
electrodeposited coatings, 440*A*.
electrodeposition of nickel, 439*A*.
HOUDREMONT, E.:
alloy steels, 490*A*.
case-hardening of steel, 412*A*.
flakes in steel, 384*A*.
heat treatment of vanadium steel, 418*A*.
high-speed steel manufacture, 382*A*.
intercrystalline corrosion, 521*A*.
HOUGH, S. O., effect of deoxidation on grain size, 502*A*.
HOUGH, W. R., electric drives for cleaning machines, 435*A*.
HOUSER, A. M., valve steels, 515*A*.
HRUSKA, J. H.:
hardness measurement, 470*A*.
measurement of metallic coatings, 442*A*.
solidification of ingots, 384*A*.
tool steel manufacture, 373*A*.
HUDIG, J., blast-furnace slag as fertiliser, 358*A*.
HUDSON, F., moulding sands, 365*A*.
HUDSON, J. C.:
corrosion of ship plates, 516*A*.
corrosion tests on wires, 516*A*.
HUMPHREY, N. A., insulation of furnaces, 327*A*.
HUNT, L. B.:
deep-drawing of steel, 394*A*.
resistance welding, 424*A*.
HURST, J. E.:
foundry practice, 360*A*.
hardening of cast iron, 414*A*.
permanent set in cast iron, 447*A*.
properties of cold-blast iron, 448*A*.
IMHOFF, W. G., spangle formation in galvanising, 441*A*.
IWASÉ, K., catalysts for cementation process, 412*A*.

JACKSON, C. E., tests of moulding sand, 364*A*.
JACOBS, F. B., polishing of metals, 434*A*.
JAHNE, L., Feistritz iron works, 406*A*.
JAMES, E. A., elected member, 2.
JAMISON, E. A., propane and butane, 350*A*.
JARACH, M., determination of molybdenum, 529*A*.
JEFFS, H. S., resistance welding, 424*A*.
JENKIN, J. W., pickling practice, 436*A*.
JENKNER, A., benzol yield in coking, 344*A*.
JEZEK, K., stresses in welds, 431*A*.
JIMENO, E. and GRIFOLL, I.:
Note, "Electro-Chemical Interpretation of Cleaning," 301.
JOHNSON, C. M., corrosion tests of chromium and chromium-nickel steel, 520*A*.
JOHNSON, E. R., creep of chromium-molybdenum steel, 476*A*.
JOHNSTON, J.:
corrosion, 519*A*.
steel manufacture, 373*A*.
JOLIVET, H., corrosion of metals at high temperatures, 517*A*.
JOMINY, W. E., tests of materials, 499*A*.
JONES, J. W.:
forging practice, 392*A*.
properties of metals, 484*A*.
JONES, N. E. T., elected member, 2.
JONES, S. H., coal series of North-West Gower, 316*A*.
JONES, W. D., sintering of metal powders, 436*A*.
JONES, W. R. D., forging of chain links, 392*A*.
JUNGNITZ, G., control apparatus, 333*A*.
JÜRGENSMEYER, W., roller bearings, 396*A*.

KAIN, C. H., defects in castings, 371*A*.
KALKHOF, W., recording of operations, 405*A*.
KALLEN, H.:
alloy steels, 490*A*.
hardening of tool steel, 417*A*.
high-speed steel manufacture, 382*A*.

KAO, P., coal in China, 318*A*.
KAR, H. A., determination of copper, 529*A*.
KASPAR, C., electrodeposition of nickel, 439*A*.
KASSEL, L. S., coal sampling, 532*A*.
KELLER, J. D., heating of steel, 389*A*.
KELLOGG, D. R., electrodeposition of iron, 440*A*.
KENT, B. B.:
enamelling of cast iron, 444*A*.
enamelling plants, 444*A*.
KERSTEN, M., elastic modulus of ferromagnetic materials, 458*A*.
KIEL, F., bearings, 396*A*.
KINNELL, D. R., cast-iron pipes, 367*A*.
KINZEL, A. B.:
determination of oxides, 259*D*.
fusion welding, 429*A*.
KINZIE, C. J., enamels, 444*A*.
KJERRMAN, B., hardening of bearing races, 418*A*.
KLÄRDING, J., blast-furnace burdens, 354*A*.
KLEDITZ, E., German specification for chains, 495*A*.
KLINGER, P.:
determination of alumina, 528*A*.
determination of aluminium, 528*A*.
determination of molybdenum and titanium, 529*A*.
determination of oxides, 528*A*.
determination of silicon, 530*A*.
determination of zirconium, 530*A*.
KLOOSTER, H. S. VAN, etching of cementite, 499*A*.
KNECHT, W., transformations in iron, 508*A*.
KNIGHT, O. A., metallographic work at low temperatures, 499*A*.
KNIGHT, R. L., elected member, 2.
KNIPP, E., gas permeability of moulding sand, 365*A*.
KNOCH, M., properties of steel at high temperatures, 479*A*.
KNOX, J. D.:
heat treatment of steel castings, 417*A*.
strip mill of Youngstown Sheet and Tube Co., 400*A*.
KNÜPPEL, H., ageing of steel, 469*A*.
KOBAYASI, M., decarburisation of steel, 412*A*.
KOBE, K. A., gas analysis, 533*A*.
KOCH, W.:
determination of molybdenum and titanium, 529*A*.
determination of silicon, 530*A*.
KOEPPEL, C., stressing of coke-oven walls, 325*A*.
KÖHLER, G., air infiltration in open-hearth furnaces, 375*A*.
KOJIMA, G., tungsten magnet steel, 497*A*.
KÖNIG, E., determination of benzol in gas, 534*A*.
KORB, L. F., elected member, 2.
KÖRBER, F., oxides in steel, 379*A*.
KORITNIG, O. T., treatment of wood for pattern making, 362*A*.
KORSCHAN, H., flakes in steel, 384*A*.
KÖSTER, W.:
heat treatment of ternary alloys, 510*A*.
iron-cobalt-titanium system, 512*A*.
KOWALSKI, G., coking properties of coal, 342*A*.
KRAMER, J., benzoate method of analysis, 532*A*.
KRAUS, C. E., tests on cutting fluids, 436*A*.
KREIS, H., calculation of production costs, 405*A*.
KRINGS, W., metal-slag equilibrium, 381*A*.
KRIVOBOK, V. N., iron-chromium alloys, 511*A*.
KRIZ, S., treatment of chromium-nickel-tungsten steel, 386*A*.
KROLL, W., effect of beryllium in steel, 493*A*.
KRONENFELS, W. VON, decarburisation of cast iron by hydrogen, 449*A*.
KROUPA, G., gas cleaning, 348*A*.
KRYSTOF, J., corrosion-fatigue of tin and zinc coatings, 526*A*.

LACOMBE, M. DE, plasticity of steel, 466*A*.
LAFFARGUE, measurement of gases, 332*A*.
LAISSUS, J., metallic-cementation, 518*A*.
LAMBERT, J. L., coking tests of coal, 341*A*.
LANG, J., elected associate, 3.
LANGE, B., temperature regulators, 334*A*.
LANGEBECK, H. H., behaviour of carbon in cupola practice, 360*A*.
LAPELLE, R. R., bright normalising of sheet and strip, 411*A*.
LAWRENCE, V. H., sheet steels, 488*A*.
LEADBEATER, C. J., yellow stain on tinplates, 442*A*.

LE CHATELIER, C., theoretical temperature of combustion, 329*A*.
LECŒUVRE, R., prevention of corrosion by electrolytic action, 518*A*.
LEE-BIRD, W. J., elected member, 2.
LEGENDRE, R., corrosion tests in sea water, 517*A*.
LEHMANN, F., elected member, 2.
LEHMKÜHLER, H., phosphorus content of coal and coke, 335*A*.
LEHRMAN, L., benzoate method of analysis, 532*A*.
LEINEWEBER, M., open-hearth refractories, 325*A*.
LEITGEBEL, W., vapour-pressure/temperature relation of metals, 513*A*.
LEON, A., tests on cast iron, 448*A*.
LEONHARDT, R. W. P., remote control of blast-furnaces, 353*A*.
LEOPOLD, H.M. KING OF THE BELGIANS, elected Hon. Member, 7.
LEPAN-DREVDAL, French specifications for steel, 495*A*.
LÉPINGLE, M., refractory materials, 322*A*.
LEROY, A., welding of rustless steel, 517*A*.
LE VAN, E. E., hard facing of metals, 433*A*.
LEWIEN, E., coal sampling in washeries, 533*A*.
LEWIS, K. G.:
  effect of mill scale on paint performance, 516*A*.
  temper colours, 420*A*.
LEWIS, W. E., brittleness in steel, 471*A*.
LEWIS, W. E. J., corrosion of ships, 524*A*.
LEWIS-DALE, P., corrosion, 268*D*.
LEYENSETTER, W., machining of steel, 473*A*.
LIEBERHERR, A., stresses in boiler plates, 466*A*.
LIEBERKNECHT, K., ageing of steel wire, 477*A*.
LIGHTNER, M. W., effect of deoxidation on ferrite formation, 503*A*.
LIPPERT, T. W.:
  rolling of molten metals, 403*A*.
  silicon steel, 498*A*.
LISSNER, A., corrosion-resistant steel, 514*A*.
LITTERSCHEIDT, W., heat flow in coking process, 345*A*.
LOBE, C. M., jun., molybdenum in cast iron, 455*A*.
LOBLEY, A. G., electric heat-treatment furnaces, 410*A*.
LÖBNER, A., cupola practice, 360*A*.
LOCH, L., magnesite deposits, 318*A*.
LOHMANN, F. W., welding of structural steel, 428*A*.
LOHMANN, W.:
  stresses in welds, 430*A*.
  welding, 421*A*.
LOISEAU, J., chromium plating and cadmium plating, 518*A*.
LONGENECKER, C., plant of Youngstown Sheet and Tube Co., 351*A*.
LONGWELL, J. R., carbide dies for wire drawing, 407*A*.
LORIG, C. H.:
  carburising of copper steel, 412*A*.
  copper in malleable cast iron, 455*A*.
  copper steel, 492*A*.
LOSANA, L., determination of molybdenum, 529*A*.
LOSKIEWICZ, W., elected member, 2.
LOWE, R., elected member, 2.
LÖWER, R.:
  pipe founding, 367*A*.
  re-use of foundry pattern, 362*A*.
LUCAS, F. F., nodular troostite, 506*A*.
LÜTGEN, T., basic Bessemer practice, 374*A*.
LUYKEN, W., valuation of iron ore, 320*A*.
LYON, K. C., burning of magnesite bricks, 323*A*.

MAAG, O. L., lubrication of bearings, 397*A*.
MCADAM, D. J., jun., fatigue of metals, 479*A*.
MCBRIDE, D. L.:
  effect of deoxidation on ferrite formation, 503*A*.
  effect of deoxidation on grain size, 502*A*.
  effect of deoxidation on impact strength, 478*A*.
MCCALL, M. M., wrought car wheels, 392*A*.
MACCALLUM, D. A., ancient iron in Scotland, 359*A*.
MCCANCE, A.:
  blast-furnace practice, 354*A*.
  scaling of steel, 206*D*.
  slags, calcium ferrites, 112*D*.
MACCUTCHEON, A. M., electric drives for cleaning machines, 435*A*.
MCEWAN, S., Loeffler boiler, 330*A*.
MACGREGOR, C. W., effect of notches in testing, 464*A*.

MACHIN, W., steel castings, 368*A*.
MACHU, W., pickling of iron, 437*A*.
McIVOR, W. L., arc-welding, 423*A*.
McKEE, A. G., blast-furnace practice, 351*A*.
McMULLEN, C., oxidation of refractory materials, 323*A*.
MACNAUGHTAN, D. J.:
electrodeposited coatings, 440*A*.
porosity of tin coatings, 442*A*.
McQUAID, H. W., hardening practice, 417*A*.
MACQUARIE, C., elected associate, 3.
MAHIN, W. E., nitriding of chromium-molybdenum - vanadium steel, 413*A*.
MAHLER, J. H., pulverised coal, 339*A*.
MAIER, A. F., alternating stressing of tubes, 484*A*.
MAILÄNDER, R.:
determination of creep limit, 475*A*.
notch sensitiveness of steel, 480*A*.
torsional fatigue strength of steel, 481*A*.
MAIN, S. A.:
spring steels, resistance to repeated impact, 177*D*.
spring steels, surface decarburisation, 160*D*.
stainless steels, 514*A*.
MALCOR, H.:
heat exchange in open-hearth furnaces, 377*A*.
heat radiation from dust clouds, 329*A*.
MALKIEWICZ, T., elected member, 2.
MANDRAN, G., spot welding, 425*A*.
MANN, H. C., tensile-impact tests, 459*A*.
MARSHALL, A., patternmaking, 362*A*.
MARSHALL, D. F.:
Paper, "Further Determinations of the External Heat Loss of Blast-Furnaces," 59. *Discussion*, 84. *Author's Reply*, 88.
MARTIN, E., iron/iron-oxide/calcium-orthoferrite system, 383*A*.
MATHAR, J., stress determination in structures, 463*A*.
MATHIEU, M., high-frequency furnaces, 382*A*.
MATTING, A., etching reagent, 499*A*.
MATTOCKS, E. O., pyrometers, 409*A*.
MATUSCHKA, B.:
Paper, "Non-Metallic Inclusions in Ferro-Alloys," 213. *Correspondence*, 221. *Author's Reply*, 223.
MAURER, E.:
determination of oxides, 528*A*.
properties of forgings, 485*A*.
MAYER, C. F., heat treatment of roller bearings, 420*A*.
MAYERS, M. A., combustion of pulverised coal, 339*A*.
MEARS, R. B.:
corrosion tests, 284*D*.
probability of corrosion, 516*A*.
reproducible scratches on metals, 521*A*.
MEBOLDT, W., cast iron as bearing material, 452*A*.
MEGGERS, W. F., arc spectrum of iron, 501*A*.
MEHL, R. F., metallurgical progress, 498*A*.
MEHLIG, J. P., determination of manganese, 531*A*.
MEICHSNER, A., heat of formation of iron phosphide, 356*A*.
MELLOTT, M. K., hot-blast stoves, 352*A*.
MELOCHE, V. W., gases in enamels, 445*A*.
MERICA, P. D., precipitation hardening, 467*A*.
MERKLEN, J., properties of rail steel, 488*A*.
MESSKIN, W. S., nickel-aluminium magnet steel, 497*A*.
MEURES, K., enamels, 445*A*.
MEYER, J., burning losses in heating furnaces, 389*A*.
MEYER, O.:
iron-sulphide/manganese equilibrium, 379*A*.
nitrogen in slags, 383*A*.
MEYER, W. R., determination of nickel and chlorides in plating baths, 531*A*.
MEYERCORDT, F., endurance of metals, 479*A*.
MEYERHOFF, H. A., magnetite in Puerto Rico, 317*A*.
MICHAELIS, P., coking tests on stored coal, 342*A*.
MICHALKE, M., effect of slag on cast iron, 449*A*.
MICHEL, A.:
corrosion-resistant steel, 517*A*.
machining of rustless steel, 517*A*.
MIERDEL, G., electro-filters, 348*A*.
MILLER, H. L., alloy steel, 493*A*.
MILLER, J. W., nitrogen in weld metal, 426*A*.
MILLINGTON, E., spring steels, 153*D*.

MILLS, H. R.:
Paper, "The Resistance of Spring Steels to Repeated Impact Stresses." *See* Hankins, G. A.
MITSCHE, R., awarded Carnegie Research Grant, 33.
MOE, H. L., valve steels, 515*A*.
MÖLLER, H., stress measurement, 465*A*.
MÖNNIG, H., decomposition of Ruhr coal, 335*A*.
MONTELUCCI, G., cadmium-zinc coatings, 518*A*.
MOOREY, E. H. ST. C., elected associate, 3.
MORANGE, J., cleaning of producer gas, 348*A*.
MORAWA, F. W.:
open-hearth furnaces, 374*A*.
open-hearth refractories, 325*A*.
MORAY, M., FeO–CaO–SiO_2 system, 383*A*.
MORDECAI, W. E., foundry coke, 347*A*.
MORGAN, R., corrosion, 523*A*.
MORITZ, H., spectrum analysis, 531*A*.
MORRIS, T. N., hydrogen diffusion in steel during corrosion, 527*A*.
MORT, E. R.:
box annealing of sheets, 416*A*.
rolling-mill practice, 398*A*.
sheet-mill practice, 401*A*.
MOSES, A. J., fusion-welded joints, 429*A*.
MOTT, R. A.:
coking industry, 340*A*.
coking properties of coal, 341*A*.
coking properties of durain, 345*A*.
combustion of coke, 329*A*.
De Vooys coal-cleaning process, 337*A*.
MUIR, J., overstraining of steel, 465*A*.
MÜLLER, H., flakes in steel, 385*A*.
MÜLLER, W. J., corrosion, 519*A*.
MURPHY, D. W., solubility of nitrogen in iron, 467*A*.
MYERS, E. M., open-hearth refractories, 326*A*.
MYERS, R. H., corrosion of ship plates, 516*A*.

NADAI, A., effect of notches in testing, 464*A*.
NAESER, G.:
carbon in steel, 504*A*.
decomposition of iron carbide, 506*A*.
specific heat of iron carbide, 513*A*.
NAUMANN, E., corrosion of hot-water systems, 524*A*.
NEALEY, J. B.:
forge furnaces, 388*A*.
heat treatment of springs, 411*A*.
NEAVE, D. P. C., elected member, 2.
NELSON, H. A., metal priming paint, 446*A*.
NELSON, L. H., basic open-hearth practice, 377*A*.
NETTLENBUSCH, L., benzol yield in coking, 344*A*.
NEWALL, H. E., combustion of pulverised coal, 338*A*.
NEWBERY, E., corrosion by motor-electrolytic currents, 524*A*.
NICHIGORI, S., nitriding steels, 413*A*.
NIELSON, K. L., welding of stainless steel, 425*A*.
NIPPER, H.:
awarded Carnegie Research Grant, 34.
graphite formation in cast iron, 451*A*.
NISHIYAMA, Z.:
austenite and martensite, 507*A*.
transformations in iron-nickel alloys, 508*A*.
NORBURY, A. L., foundry practice, 360*A*.
NORTHCOTT, L., sulphur prints, 502*A*.
NORTHCOTT, L. F. C., structure of scaled steel, 203*D*.
NORTON, J. T., solubility of copper in iron, 468*A*.
NOYES, E. M., elected member, 2.
NULLMEYER, F. H., wire manufacture, 407*A*.
NUSBAUM, G. W., properties of bolts, 459*A*.

ODE, W. H., coking properties of coal, 341*A*.
OLDHAM, M. C., steel castings, 368*A*.
ORAM, J. E., forced air circulation in heat-treatment furnaces, 411*A*.
ORLOWSKI, P.:
preparation of metallic surfaces, 517*A*.
Udylite process, 518*A*.
OSANN, B.:
properties of cast iron, 447*A*.
structure of cast iron, 451*A*.
OSBORG, H., effect of lithium in steel, 493*A*.
OSHIBA, F., fatigue of carbon steel, 484*A*.
ÔTA, W., catalysts for cementation process, 412*A*.
OWEN, W. C., heat treatment of spring leaves, 411*A*.

PALMER, E. W., copper in malleable cast iron, 455*A*.
PARK, C. J., elected member, 2.
PARMELEE, C. W., burning of magnesite bricks, 322*A*.
PARRY, T., elected member, 2.
PARTRIDGE, E. P., gas analysis, 534*A*.
PASCHKE, F., moulding turbine wheels, 368*A*.
PASCHKE, M., growth and scaling of cast iron, 452*A*.
PATERSON, J. H., reactions in weld metals, 426*A*.
PAVLOFF, M. A., blast-furnaces in Russia, 351*A*.
PEARCE, J. G., cast iron in chemical engineering, 453*A*.
PELLY, J. F., lubrication in steel mills, 398*A*.
PELZER, A., dedusting of coal, 337*A*.
PENDERGAST, W. L., modulus of elasticity of refractory bricks, 323*A*.
PERCIVAL, R. T., heat treatment, 415*A*.
PERSOZ, L.:
corrosion fatigue, 517*A*.
fatigue of metals, 484*A*.
PETERS, A., draft in chimneys, 353*A*.
PETTY, D. M., replacement of obsolete plant, 404*A*.
PFAFFENBERGER, J., magnetic properties of iron-nickel alloys, 498*A*.
PIER, M., hydrogenation of coal, 350*A*.
PIERCE, R. H. H., jun.:
iron-chromium alloys, 511*A*.
thermal conductivity of refractories, 324*A*.
PIERSON, C., sponge iron, 494*A*.
PING, K., coal in China, 318*A*.
PINSL, H., determination of silicon, 530*A*.
PIWOWARSKY, E.:
antimony in cast iron, 454*A*.
copper steel, 492*A*.
growth of cast iron, 452*A*.
solubility of graphite in molten iron, 451*A*.
PLOCK, C. H., fatigue and damping capacity of steel, 481*A*.
PLUNKETT, J. A., enamels, 444*A*.
POHL, F., chilled cast iron, 366*A*.
POLLACK, H., structure of steel, 505*A*.
POOL, W. J., electricity in iron industry, 331*A*.
POOLE, F. H., elected associate, 3.
PÖPPERLE, J., coal flotation, 336*A*.
PORTEOUS, J., jun., elected associate, 3.
PORTER, D. J., gas analysis, 533*A*.
PORTEVIN, A.:
corrosion, 517*A*.
inclusions in ferro-alloys, 221*D*.
iodine method of estimating oxides in steel, 255*D*.
nitrogen in weld metal, 427*A*.
tests on welds, 428*A*.
award of Bessemer Medal, 29.
POSTE, E. P., welding of pressure vessels, 424*A*.
POWELL, R. W., thermal and electrical conductivities of metals, 474*A*.
POWERS, G. E., cleaning of metals, 435*A*.
PRAETORIUS, E., waste-gas analysis, 533*A*.
PREISACH, F., precipitation hardening of iron-nickel alloys, 467*A*.
PRENTISS, F. L.:
enamelling of washing tubs, 444*A*.
hardening furnaces for springs, 411*A*.
porcelain-enamelled tiles, 444*A*.
wire-drawing and heading plant, 406*A*.
PRÉTET, E., corrosion-resistant steel, 514*A*.
PRICE, B. K., clarification of still waste liquor, 345*A*.
PRYTHERCH, J. C., porosity of tin coatings, 442*A*.
PUGH, W. D., Perrin process, 379*A*.
PULEWKA, W., frictional oxidation, 471*A*.
PULLIN, V. E., X-ray examination of welds, 432*A*.
PULSIFER, H. B., strengthening effect of bolt threads, 486*A*.
PUNGEL, W., ageing of steel wire, 477*A*.
PUTNAM, S. L., elected associate, 3.

QUINCY, L., cast-steel rolls, 395*A*.

RAINE, T., awarded Carnegie Research Grant, 33.
RAJAKOVICS, E. VON, impact-bend tests on cast iron, 448*A*.
RAM, S., corrosion of steel in sulphuric acid, 523*A*.
RAMSEYER, C. F., iron and steel manufacture, 354*A*.
RAPATZ, F., structure of steel, 505*A*.
RAUB, E., electrodeposition of nickel-iron alloys, 439*A*.
RAYBOULD, W. E., flocculation of washery water, 338*A*.

READ, H. L., silicon-carbide recuperators, 327*A*.
REDLICH, K. A., magnesite deposits, 318*A*.
REERINK, W., briquette pitch, 339*A*.
REES, W. J., coke-oven refractories, 325*A*.
REICHWALD, O. F., elected member, 2.
REID, E. F., corrosion of water mains, 525*A*.
REINHARDT, A., effect of slag on cast iron, 450*A*.
REININGER, H., cast iron for metallic coating, 452*A*.
RIBAUD, heat radiation from gases and flames, 329*A*.
RICH, F. M., slack-wind in blast-furnace practice, 355*A*.
RICHARDS, T. C., magnetic dilatometer, 474*A*.
RICHARDSON, G. T.:
Paper, "An Investigation of Spring Steels." *See* Andrew, J. H.
structure of scaled steel, 206*D*.
awarded Carnegie Research Grant, 33.
RICHARDSON, H. C., history of iron, 359*A*.
RICHTER, H., heat of formation of iron phosphide, 356*A*.
RIEDL, E., spectrum analysis, 531*A*.
RIEHL, N., X-ray fluorescent screens, 500*A*.
ROBERTSON, J. M., grain size control, 502*A*.
ROBIETTE, A. G.:
controlled atmospheres in heat treatment, 416*A*.
electric melting of cast iron, 361*A*.
ROBINSON, E. A., elected member, 2.
ROBINSON, E. L., creep test furnace, 474*A*.
ROCHOW, W. F., refractory materials, 322*A*.
RODEHÜSER, A., coal dust in moulding sand, 365*A*.
RODHAIN, P., overstressing of boiler plates, 466*A*.
ROESER, W. F.:
standard tables for thermocouples 409*A*.
tests of thermocouples, 409*A*.
ROGERS, R. R.:
electrodeposition of chromium, 439*A*.
electrodeposition of zinc, 441*A*.
ROHN, W., beryllium alloys for clock-springs, 493*A*.
ROLFE, R. T.:
effect of carbon in steel, 509*A*.
ROLFE, R. T.:
effect of elements in steel, 491*A*, 492*A*.
free-cutting steel, 487*A*.
ROLL, F., frictional oxidation, 471*A*.
ROLLASON, E. C., weld decay, 429*A*.
ROLLWAGEN, W., spectrum analysis, 531*A*.
ROONEY, T. E. and STAPLETON, A. G.:
Paper, "The Iodine Method for the Determination of Oxides in Steel," 249. *Discussion*, 255. *Authors' Reply*, 262.
ROS, M., sheet piling, 488*A*.
ROSE, A., focusing chamber for X-rays, 501*A*.
ROSE, W., moulding of steel castings, 369*A*.
ROSS, E. F., centrifugal nitricastiron, 368*A*.
ROSSOW, E., welding electrodes, 423*A*.
ROTH, W. A., heat of formation of iron phosphide, 356*A*.
ROTTER, A., slag removal from soaking pits, 388*A*.
ROXBURGH, J.:
chilling properties of iron, 366*A*.
foundry costing, 362*A*.
RUDORFF, D. W., creep of metals, 477*A*.
RUECKEL, W. C., insulating brick, 327*A*.
RUFF, W. W. O., awarded Carnegie Research Grant, 34.
RUMMEL, K., basic laws of regulation, 333*A*.
RUNCIMAN, RT. HON. WALTER, speech at dinner, 309.
RUSKA, E., electron microscope, 499*A*.
RUSSELL, G. A. V., rolling wide strip, 402*A*.
RUTHERFORD OF NELSON, RT. HON. LORD, speech at dinner, 306.
RUTTMANN, W., determination of creep limit, 475*A*.

SACHS, G., drawing of shells, 393*A*.
SAEGER, C. M., jun.:
effect of casting conditions on cast iron, 451*A*.
tests of moulding sand, 364*A*.
SALE, P. D., compression tests of steel, 476*A*.
SANDERS, T. H., spring steels, 156*D*.
SANDERSON, J. F., iron oxide control in basic process, 380*A*.
SANITER, F. H., elected associate, 3.
SANKEY, G. R., elected member, 2.

SANKEY, H. B., elected member, 2.
SARJANT, R. J., furnace heating practice, 332*A*.
SAUERWALD, F., precipitation and martensitic hardening, 467*A*.
SAXTON, R.:
alloy steels for wire drawing, 407*A*.
stainless steel wire, 407*A*.
wire drawing, 407*A*.
SAYRE, M. F.: elastic behaviour of metals, 458*A*, 474*A*.
SCHAEFER, W. J., etching of cementite, 499*A*.
SCHÄFER, O., coal cleaning, 336*A*.
SCHAFMEISTER, P., intercrystalline corrosion, 521*A*.
SCHARFFENBERG, E., chilled rolls, 366*A*.
SCHEEPERS, L., refractory materials, 322*A*.
SCHEIL, E.:
Brinell and scratch hardness, 470*A*.
fissures in heat-treated steel, 419*A*.
iron-zinc alloys, 513*A*.
stresses in quenched steel, 419*A*.
SCHENCK, H., flakes in steel, 385*A*.
SCHERER, R., high-speed steel, 490*A*.
SCHEUER, E., shrinkage of castings, 371*A*.
SCHICHTEL, K., chromium-aluminium-iron alloys, 515*A*.
SCHLIESSMANN, O., analysis of special steels, 529*A*.
SCHLÖTTER, M., electrodeposition of tin, 441*A*.
SCHMATZ, P. A., spot welding, 425*A*.
SCHMIDT, G.:
distribution of work in foundries, 362*A*.
notch-toughness of iron, 461*A*.
SCHNEIDER, G., failure of boiler drum, 487*A*.
SCHNEIDER R., Siegerland-Wieder iron-ore mining, 316*A*.
SCHNEIDER, W., welding, 421*A*.
SCHOTTKY, H., welding of heat-resistant steel, 425*A*.
SCHRADER, H.:
burning of alloy steel, 389*A*.
case-hardening of steel, 412*A*.
heat treatment of vanadium steel, 418*A*.
SCHRAMM, G. N., alloy steels, 490*A*.
SCHUBIN, NATALIE, nitriding of cast iron, 413*A*.
SCHÜLE, G., moulding steam cylinders, 367*A*.
SCHULTE, F., iron-sulphide/manganese equilibrium, 379*A*.
SCHULZ, E. H., ageing of steel wire, 477*A*.
SCHULZE, A., magnetostriction, 496*A*.
SCHULZE-MANITIUS, H., transport in foundries, 370*A*.
SCHUMACHER, E. E., magnetic materials, 495*A*.
SCHUMB, W. C., determination of zirconium, 532*A*.
SCHUSTER, H., growth and scaling of cast iron, 452*A*.
SCHUSTER, L. W., bend tests, 458*A*.
SCHÜZ, E., chilled rolls, 366*A*.
SCHWARZ, M. VON, scale formation in heat treatment, 415*A*.
SCHWIEDESSEN, H., thermo-technological calculations, 328*A*.
SCHWINNING, W.:
properties of metals at low temperatures, 478*A*.
properties of steel at high temperatures, 479*A*.
SCOTT, H. K., mineral industry of Yugoslavia, 316*A*.
SEAQUIST, E. O., properties of bolts, 459*A*.
SEARLE, A. B., refractory materials, 322*A*.
SEARS, J. D., coal in New Mexico, 317*A*.
SEDLACZEK, H., guide-boxes, 399*A*.
SEELIG, A. E., producer practice, 347*A*.
SÉFÉRIAN, D.:
autogenous welding, 422*A*.
nitrogen in weld metal, 427*A*.
SEGER, A. G., annealing plant of Motor Wheel Corp., 411*A*.
SEIGLE, J., magnetic concentration of oolitic ore, 320*A*.
SEKIGUCHI, H., corrosion of steel in soya bean souse, 515*A*.
SELIGMAN, R., elected member, 2.
SELTZ, H., ash-fusion temperature of coal mixtures, 328*A*.
SELVIG, W. A., coking properties of coal, 341*A*.
SENFTER, E.:
heat distribution in heating furnaces, 390*A*.
time studies, 405*A*.
SENTENAC, J., corrosion, 519*A*.
SERVICE, T. M.:
corrosion, 518*A*.
steel manufacture, 376*A*.
SHADGEN, J. F., steel sheets for insulation, 330*A*.
SHAPIRO, C. L., brittleness in steel, 470*A*.
SHAUER, J., elected member, 2.

Shaw, G. M., thickness determination of plates and castings, 521*A*.
Shaw, H., wear of metals, 471*A*.
Shelton, S. M.:
fatigue of wire, 482*A*.
properties of enamels, 444*A*.
Sherman, R. A.:
combustion of pulverised coal, 338*A*.
radiation from natural-gas flames, 329*A*.
Sidney, L. P., blast-furnace practice, 353*A*.
Siebel, E.:
deformation in wire-drawing, 408*A*.
flow of material in tube-drawing, 404*A*.
stress distribution in metals, 462*A*.
Silverman, L., determination of sulphur, 530*A*.
Simonds, H. R.:
metal finishing, 438*A*.
nickel-clad steel, 445*A*.
Simpson, S. G., determination of zirconium, 532*A*.
Sims, C. E., porosity in steel castings, 371*A*.
Sinclair, J., coking plant of Yorkshire Coking and Chemical Co., 340*A*.
Sinnatt, F. S., hydrogenation of tar, 350*A*.
Skroch, K.:
burning losses in heating furnaces, 389*A*.
hot-blast stoves, 352*A*.
Slater, I. G., electrodeposition, 438*A*.
Slattenschek, A., tests on cast iron, 448*A*.
Sloman, H. J., grindability of coal, 338*A*.
Smith, C. S., copper in malleable cast iron, 455*A*.
Smith, H. A., reactions in solid state, 507*A*.
Smith, N., corrosion, 523*A*.
Smith, P. S., mineral industry of Alaska, 316*A*.
Smith, W. A., elected associate, 3.
Snedden, W. P., elected member, 3.
Snyder, W. E., motors for steel mills, 404*A*.
Société des Tréfileries et Laminoirs du Havre, corrosion tests in sea water, 517*A*.
Söhnchen, E.:
coefficient of expansion of cast iron, 449*A*.
copper steel, 492*A*.
growth of cast iron, 452*A*.
raw materials in German metal industry, 358*A*.
Soler, G., insulation of open-hearth furnaces, 327*A*.
Somin, B. E., nickel-aluminium magnet steels, 497*A*.
Sonntag, A., open-hearth refractories, 325*A*.
Sopwith, D. G., design of crane hooks, 489*A*.
Southern, H., furnace efficiencies, 332*A*.
Southwell, R. V., impact tests, 460*A*.
Soutter, J. W. P., elected member, 3.
Spangler, S. F., reclamation of spent pickling liquor, 437*A*.
Spanner, E. F., heat transmission, 330*A*.
Späth, W., models demonstrating phenomena in loaded materials, 458*A*.
Sponheuer, A., hardening and tempering phenomena in chromium steel, 509*A*.
Sprunk, G. C., properties of American coals, 341*A*.
Stäblein, F., thermoperm, 496*A*.
Stach, E., examination of dusts, 339*A*.
Stahl, F., elected member, 3.
Stancey, R., coking properties of coal, 342*A*.
Stapleton, A. G.:
Paper, "The Iodine Method for the Determination of Oxides in Steel." *See* Rooney, T. E.
Stark, H., stress condition in buffer springs, 487*A*.
Stead, H., patternmaking, 362*A*.
Steffes, M.:
blast-furnace practice, 355*A*.
effect of humidity on gases, 330*A*.
gas engines *versus* steam turbines, 331*A*.
Steinberg, S., transformation of austenite, 507*A*.
Stengel, E., determination of molybdenum and titanium, 529*A*.
Stevenson, W. W.:
determination of nitrogen, 530*A*.
determination of oxides, 257*D*.
Stickel, P., Moll checker bricks, 375*A*.
Stodt, W., bearings, 397*A*.
Stone, R. H., crucible melting practice, 373*A*.
Stranner, F. D., tool steels, 435*A*.
Straumanis, M., corrosion, 519*A*.
Strauss, J., nitriding of chromium-molybdenum-vanadium steel, 413*A*.
Strausser, P. W. C., corrosion of nickel and chromium coatings, 526*A*.

STRICKLER, H. S., ash-fusion temperature of coal mixtures, 328*A*.
STUEBING, A. F., alloy steels, 490*A*.
SUN, C. C., coal in China, 318*A*.
SUSIN, V., transformation of austenite, 507*A*.
SUTTON, H., fatigue of spring steels, 177*D*.
SWANGER, W. H.:
fatigue of wire, 482*A*.
shrink-fits, 434*A*.
SWEETSER, R. H., anthracite in blast-furnaces, 336*A*.
SWINDEN, T.:
determination of oxides, 258*D*.
high-frequency furnaces, 382*A*.
spring steels, 152*D*.
structure of scaled steel, 203*D*.
SYKES, C., and EVANS, H.:
Paper, "Transformations in Iron-Aluminium Alloys," 225.

TAINTON, U. C., cleaning of metals, 436*A*.
TAJI, Y., nickel alloys, 493*A*.
TAMAKI, M., nickel-chromium steels, 420*A*.
TAVERNER, I. D., elected member, 3.
TAYLERSON, E. S., alloy steels, 490*A*.
TAYLOR, A., elected member, 3.
TAYLOR, A. H., hydrogenation plant, 350*A*.
TAYLOR, J. H., effect of openings in pressure vessels, 464*A*.
TEMPLIN, R. L. tensile tests, 457*A*.
THANHEISER, G., reactions in acid open-hearth process, 377*A*.
THAU, A., low-temperature distillation, 346*A*.
THEOBALD, W., history of wire drawing, 406*A*.
THIESSEN, R., properties of American coals, 341*A*.
THOMAS, B., effect of manganese in steel, 491*A*.
THOMAS, G. O., bituminous coatings for pipes, 445*A*.
THOMPSON, F. C., history of wire drawing, 406*A*.
THUM, A.:
design of welded parts, 426*A*.
endurance of metals, 479*A*.
properties of cast iron, 453*A*.
THUM, E. E., cutting of metals, 433*A*.
TILTON, A. O., arc welding, 423*A*.
TIMMINS, A. A., awarded Carnegie Research Grant, 34.
TINNON, J. B., thermit welding, 422*A*.
TODHUNTER, W. J., elected member, 3.
TOFAUTE, W.:
hardening and tempering phenomena in chromium steel, 509*A*.
precipitation in tempering steel, 420*A*.
X-ray examination of welds, 432*A*.
TOKUNAGA, M., specific heat of alloys, 513*A*.
TONN, W.:
Brinell and scratch hardness, 470*A*.
wear of iron alloys, 472*A*.
TOUCEDA, E., malleable cast iron, 455*A*.
TOWNSEND, C. W. D., steel foundry practice, 369*A*.
TOWNSHEND, H. W., corrosion of ships, 282*D*.
TRANTER, G. D., teeming practice, 376*A*.
TRUSHEIM, F., Amberg iron ore deposits, 316*A*.
TSCHULENK, L., Tschulenk tube making process, 404*A*.
TUCKER, R. C., blast-furnace heat loss, 86*D*.
TURNER, A. A., oxidation of refractory materials, 323*A*.
TURNER, T. H., corrosion 266*D*.
TYLER, P. M., titanium, 378*A*.
TYRIE, T., defects in castings, 370*A*.

UDE, H., durability of structures, 482*A*.
UHLEMANN, K., properties of steel at high temperature, 479*A*.
ULRICH, M., weldless boiler drums, 392*A*.
UMINO, S., specific heat of iron-carbon alloys, 513*A*.

VALLOT, E., properties of rail steel, 488*A*.
VALTIER, F., moulding sands, 365*A*.
VAN ECK, H. J., elected member, 2.
VAUPEL, O., X-ray fluorescent screens, 500*A*.
VERHOTUROV, A. I., dedusting of blast furnace gas, 349*A*.
VÉRY, G., cold-working of corrosion-resistant steel, 517*A*.
VICKERS, J. B., awarded Carnegie Research Grant, 33.
VIELER, F., gas transportation in Saar, 349*A*.
VIEREGGE, H. F., stress distribution in metals, 462*A*.

VLCHEK, F. J., forge hammers, 392*A*.
VOGEL, R.:
iron/iron - oxide/calcium-orthoferrite system, 383*A*.
sulphur-manganese steels, 491*A*.
VOGELSANG, F., moulding steam cylinders, 367*A*.
VOOS, E., temperature regulators, 334*A*.
VOSS, H., surface-hardening of crank-shafts, 414*A*.

WACLAWIK, A., arc welding, 423*A*.
WADLEIGH, W. H., properties of enamels, 444*A*.
WAHL, A. M., stress concentration produced by holes, 464*A*.
WAITE, L. M., rotary cleaning machines, 362*A*.
WALKER, W. S.:
oxy-acetylene welding, 422*A*.
cutting of metals, 433*A*.
elected member, 3.
WALLICHS, A., machinability of steel, 473*A*.
WALLMANN, K., X-ray examination of welds, 431*A*.
WALLS, F. J., permanent moulds, 363*A*.
WALTER, E., electrodeposition of nickel-iron alloys, 439*A*.
WARD, E. D., reproducible scratches on metals, 521*A*.
WARD, G. O., elected member, 3.
WARING, G. A., coal in Alaska, 317*A*.
WARREN, W. B., carbonisation of coal, 343*A*.
WATERS, E. O., effect of openings in pressure vessels, 464*A*.
WATTS, C., manufacture of steel balls, 435*A*.
WATTS, O. P., voltaic couples and corrosion, 519*A*.
WEARE, A. T., alloy cast iron, 454*A*.
WEBB, C. E., magnetic testing, 495*A*.
WEBBER, A. F., blast-furnace heat loss, 87*D*.
WEBER, E., flow of material in tube drawing, 404*A*.
WEEKSTEIN, S. M., precision rolling-mills, 403*A*.
WEHRHEIM, O., injection of flue-dust in blast-furnaces, 355*A*.
WEIBEL, E. E., stress determination, 465*A*.
WEISS, L., cold-rolling, 400*A*.
WELTER, R.:
effect of humidity on gases, 330*A*.
gas engines *versus* steam turbines, 331*A*.
WENING, H. E., adhesion of rubber to metal, 446*A*.
WENSEL, H. T., tests of thermocouples, 409*A*.
WENTRUP, H., carbon - oxygen equilibrium in steel, 381*A*.
WERNICK, S., electrodeposition, 438*A*.
WERZ, W., determination of molybdenum, 529*A*.
WESEMANN, F., burning losses in heating furnaces, 389*A*.
WEST, C. L., controlled atmospheres in heat treatment, 416*A*.
WEST, W., alloy cast iron, 454*A*.
WEVER, F.:
carbon in steel, 504*A*.
focusing chamber for X-rays, 501*A*.
WHEELER, R. V., coking properties of coal, 341*A*.
WHETZEL, J. C., steels for weight reduction, 485*A*.
WHINCUP, N., elected member, 3.
WHITAKER, A., elected member, 3.
WHITE, A. E., properties of steel at high-temperatures, 477*A*.
WHITE, J., GRAHAM, R. and HAY, R.:
Paper, "An Investigation into the Oxidising Power of Basic Slags. Part I.—The Determination of the Binary Diagram CaO-Fe_2O_3. Part II.—The Determination of the Dissociation Pressures of Fe_2O_3, CaO.Fe_2O_3 and 2CaO.Fe_2O_3," 91. *Correspondence*, 112. *Authors' Reply*, 113.
WHITEHEAD, D. A., liquid fuel, 350*A*.
WHITEHOUSE, F., green-sand cores, 364*A*.
WHITELEY, J. H.:
Paper, "An Effect of Oxygen and Sulphur on Iron in Scaling," 181. *Discussion*, 200. *Correspondence*, 206. *Author's Reply*, 207.
WHITFIELD, J. F., elected associate, 3.
WHITNEY, L. C., elected member, 3.
WHITTEMORE, H. L., properties of bolts, 459*A*.
WIEST, P., X-ray examination of wire ropes, 489*A*.
WIESTER, H. J., metallographic films, 500*A*.
WILKINS, E. T., flocculation of slurries, 338*A*.
WILLARD, H. H., determination of chromium in plating baths, 531*A*.
WILLIAMS, H., rolling process, 395*A*.
WILLIAMS, J. S., gas analysis, 533*A*.

WILLIAMS, R. C., lubrication in wire-drawing, 397*A*.
WILSON, N. C., presses and press tools, 393*A*.
WILSON, R. L., properties of steel at high temperatures, 477*A*.
WILTEN, H. M.:
ageing embrittlement of chromium steel, 469*A*.
wrought iron, 493*A*.
WINDIATE, G. H. F., use of town gas, 349*A*.
WINNE, H. A., Selsyn apparatus for rolling mills, 403*A*.
WINTER, H., decomposition of Ruhr coal, 335*A*.
WINTERGERST, P., temperature of rolls, 395*A*.
WITTE, W., mining industry of Lahn District, 316*A*.
WITTING, E., waste-heat, 331*A*.
WOERNLE, R.:
wire ropes, 489*A*.
X-ray examination of wire rope, 489*A*.
WOHLFAHRT, S., insulation of steel furnaces, 327*A*.
WOOD, H. C., mechanical equipment of coke ovens, 340*A*.
WOOD, T. E., insulating brick, 327*A*.
WORMWELL, F.:
corrosion tests, 285*D*., 516*A*.
probability of corrosion, 273*D*.
WRIGHT, R. H., electric power in steel plants, 403*A*.
WYK, W. R. VAN, measurement of corrosion, 520*A*.
WYZALCK, J. F., carburising practice, 412*A*.

YOSHIOKA, Y., elected member, 3.
YOUNG, C. B., anode and cathode efficiencies in electroplating, 439*A*.
YOUNG, C. B. F., electrodeposition of cadmium-zinc alloys, 440*A*.
YOUNG, J. R., elected member, 3.
YOUNG, P., determination of chromium in plating baths, 531*A*.

ZAVARINE, I. N., mechanism of quenching, 418*A*.
ZIEGLER, F. K., X-ray examination of castings, 501*A*.
ZSÁK, V., properties of manganese steel, 491*A*.

Printed for THE IRON AND STEEL INSTITUTE *by arrangement with* THE IRON AND COAL TRADES REVIEW *by* F. J. PARSONS, LTD., *London and Hastings.*